SONY

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Information Technology Company

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PCS-C150/PCS-C150P

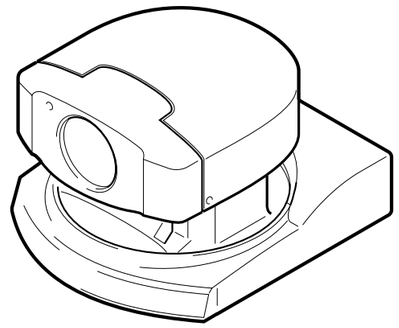
9-928-130-11 99E09008-1

SONY

PCS-C150/C150P

SERVICE MANUAL

PCS-C150 (NTSC)
PCS-C150P (PAL)



SPECIFICATIONS

System

Video signal	PCS-C150 : NTSC standards PCS-C150P : PAL Color, CCIR standards
Picture element	1/3 inch color CCD (Total picture element number : PCS-C150 : Approx. 410,000 PCS-C150P : Approx. 470,000) (Effective picture element number : PCS-C150 : Approx. 380,000 PCS-C150P : Approx. 440,000)
Lens	Electromotion twelve fold zoom lens f=5.4 to 64.8mm, F1.8 to F2.7 Horizontal angle : 4.4º to 48.8º
Point-blank range	WIDE end : 10mm TELE end : 800mm
Minimum illumination	7 lux (F1.8)/with 50IRE
Illumination range	7 to 100,000 lux
Shutter speed	PCS-C150 : 1/60 to 1/10,000 (VISCA control) PCS-C150P : 1/50 to 1/10,000 (VISCA control)
Gain selector	Automatic/manual
Horizontal resolution	NTSC : 460 TV PAL : 450 TV
Video S/N	48 dB
Pan/tilt action	Horizontal : 100º, Vertical : 25º

Input/output terminals

Processor terminal	D-sub 15 pin
Output control terminal	8 pin mini DIN

General

Input voltage	DC 12 to 14 V
Power consumption	11 W (Refference value)
Operating temperature	0º to 40º (32º to 104ºF)
Storage temperature	– 20º to 60º (– 4º to 140ºF)
Dimensions	Approx 142 × 109 × 162 mm (w/h/d)
Mass	Approx. 1,200 g (42.3 oz.)

COLOR VIDEO CAMERA

SONY

9-928-130-11

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer :

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.

2. Check the interboard wiring to ensure that no wires are “pinched” or contact high-wattage resistors.

3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.

4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.

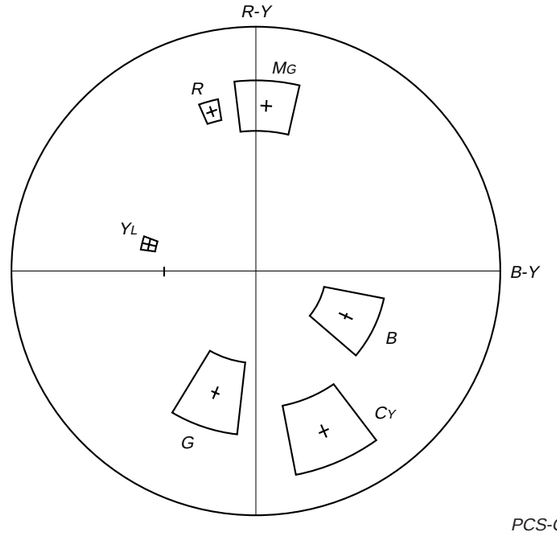
5. Check the line cord for cracks and abrasion. Recommend the replacement of any such line cord to the customer.

6. Flexible Circuit Board Repairing
   - Keep the temperature of the soldering iron around 270°C during repairing.
   - Do not touch the soldering iron on the same conductor of the cir cuit board (within 3 times).
   - Be careful not to apply force on the conductor when soldering or unsoldering.

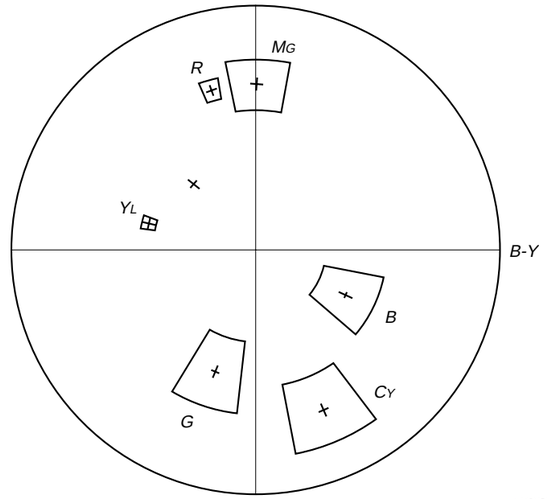
SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

FOR CAMERA COLOR REPRODUCTION ADJUSTMENT



PCS-C150 (NTSC)



PCS-C150P (PAL)

TABLE OF CONTENTS

1. GENERAL

• Locations of Controls 1-1
• Precautions 1-1
• Connections 1-2E
• Turning on the Power 1-2E

2. DISASSEMBLY

2-1. Camera Cabinet (Upper) 2-1
2-2. Bottom Plate Assy 2-1
2-3. Main Block 2-2
2-4. ID-11A (A) Board 2-2
2-5. Pan Base Assy 2-3
2-6. LI-55A (A) Board 2-3
2-7. Pan Cabinet 2-4
2-8. CCD Lens Assy 2-4
2-9. Camera Cabinet (Lower) 2-5
2-10. Stepping Motor 2-5
2-11. LI-59A (A) Board 2-6
2-12. LD-84A (A)/84A (B) Board 2-6
2-13. VC-179 (A)/179 (B) Board 2-7
2-14. RS-67A (A)/LB-47A (A) Board 2-7
2-15. MD-68 (A) Board 2-8E
2-16. Lens Block 2-8E
2-17. CD-154A (A) Board 2-8E
2-18. CCD Fitting Adaptor (H) 2-8E

4. BLOCK DIAGRAM/SCHEMATIC DIAGRAM (Extra number: 9-928-130-41)

4-1. Overall Block Diagram 4-1
4-2. Schematic Diagram
• This Note is Common for Schematic Diagrams 4-3
4-2-1. CD-154A (A) Board 4-3
4-2-2. LI-52A (A), LI-55A (A) and LI-59A (A) Boards .. 4-5
4-2-3. LD-84A (A)/84A (B) Board 4-7
4-2-4. RS-67A (A) Board, LB-47A (A) Board, RM-77A (A) Board 4-9
4-2-5. VC-179 (A)/179 (B) Board (1/4) 4-11
4-2-6. VC-179 (A)/179 (B) Board (2/4) 4-13
4-2-7. VC-179 (A)/179 (B) Board (3/4) 4-15
4-2-8. VC-179 (A)/179 (B) Board (4/4) 4-17
4-2-9. MD-68 (A) Board 4-20
4-2-10. ID-11A (A) Board 4-23
4-2-11. AT-21A (A) Board 4-26

5. PRINTED WIRING BOARDS

5-1. Circuit Boards Location 5-1
5-2. Printed Wiring Boards
• This Note is Common for Printed Wiring Boards 5-2
• CD-154A (A) Board 5-2
• VC-179 (A)/179 (B) Board 5-3
• MD-68 (A) and RS-67A (A) Boards 5-5
• ID-11A (A) Boards 5-7
• AT-21A (A), LI-52A (A), LI-55A (A) and LI-59A (A) Boards 5-9
• LD-84A (A)/84A (B) Board 5-11
• LB-47A (A) and RM-77A (A) Board 5-12E

6. ADJUSTMENTS

6-1. Preparation for Adjustment
6-1-1. List of Servicing Jigs 6-1
6-1-2. Preparations 6-2
6-1-3. Precautions 6-5
6-1-4. Adjusting Remote Commander 6-6
6-1-5. Page D Address List 6-7
6-1-6. Page F Address List 6-9
6-1-7. Page 5 Address List 6-12
6-1-8. Data Processing 6-14
6-2. Camera System Adjustment
6-2-1. Power Supply Voltage Check 6-15
6-2-2. Page D Data Initialization 6-15
6-2-3. Page D Data Modification 1 6-15
6-2-4. Page F Data Initialization 6-15
6-2-5. Page F Data Modification 6-15
6-2-6. 28 MHz Original Oscillation Adjustment 6-16
6-2-7. V SUB Adjustment 6-16
6-2-8. VRG Adjustment 6-16
6-2-9. Flange Back Adjustment 6-17
6-2-10. Flange Back Check 6-17
6-2-11. Hall Adjustment 6-18
6-2-12. Picture Frame Setting 6-19
6-2-13. Color Reproduction Adjustment 6-20
6-2-14. Iris IN/OUT Adjustment 6-21
6-2-15. Max Gain Adjustment 6-21
6-2-16. Auto White Balance Standard Data Input 6-22
6-2-17. Auto White Balance Adjustment 6-22
6-2-18. White Balance Check 6-23
6-2-19. VIDEO OUT Level Check 6-23
6-2-20. Page D Data Modification 2 ..... 6-24E
6-2-21. Page 5 Data Initialization 6-24E
6-2-22. Home Position Adjustment 6-24E
6-3. Electrical Block Check
6-3-1. Pan Tilter Operation Check 6-24E

7. VISCA COMMAND LIST

7-1. VISCA Summary 7-1
7-2. PCS-C150/C150P-VISCA Connection 7-2
7-3. VISCA Communication Formats
7-3-1. VISCA Packet Structure 7-2
7-3-2. Commands and Inquiries 7-3
7-3-3. Responses to Commands and Inquiries 7-3
7-3-4. Socket Number 7-3
7-3-5. Command Execution Stop 7-3
7-4. PCS-C150/C150P Setting Commands (Network setting)
7-4-1. VISCA Network Management Commands 7-4
7-4-2. VISCA Interface Commands 7-4
7-4-3. PCS-C150/C150P Functions 7-5
7-5. PCS-C150/C150P Commands 7-6
7-6. PCS-C150/C150P Inquiry Command 7-10
7-7. Code List
7-7-1. Code list for Shutter, Iris, Gain and Wide con lens 7-12
7-7-2. Code list for Pan/Tilter status, AT mode status and MD mode status 7-13
7-8. VISCA Communications Examples 7-14E

8. REPAIR PARTS LIST

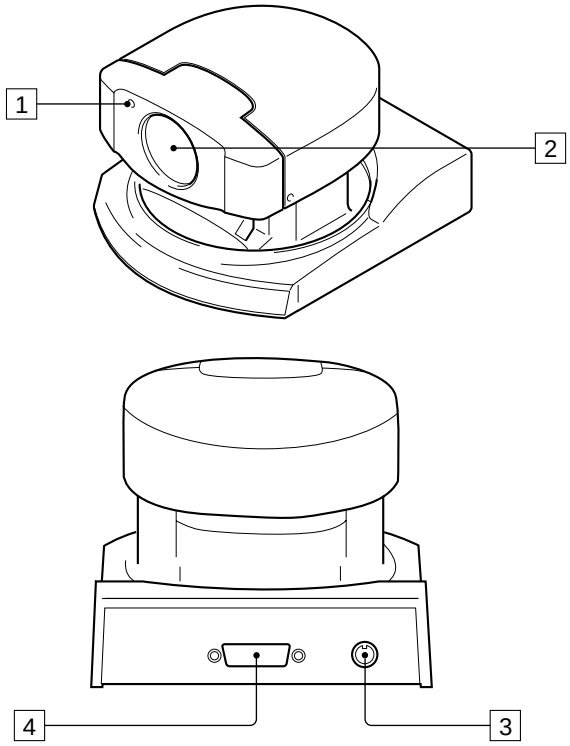
8-1. Exploded Views
8-1-1. Camera Cabinet Section 8-1
8-1-2. Pan Base Section 8-2
8-1-3. Tilt Base Section 8-3
8-1-4. Lens Section 8-5
8-2. Electrical Parts List
• AT-21A (A) Board 8-6
• CD-154A (A) Board 8-6
• ID-11A (A) Board 8-7
• LB-47A (A) Board 8-8
• LD-84A (A)/84A (B) Board 8-8
• LI-52A (A) Board 8-9
• LI-55A (A) Board 8-9
• LI-59A (A) Board 8-9
• MD-68 (A) Board 8-9
• RM-77A (A) Board 8-11
• RS-67A (A) Board 8-11
• VC-179 (A)/179 (B) Board 8-12

• For Camera Color Reproduction Adjustment 79

SECTION 1
GENERAL

General

Locations of Controls



1 Caution lamp
2 Lens
3 VISCA OUT jack
4 PROCESSOR jack

Precautions

• After operating the unit with an AC power adaptor, disconnect the AC power adaptor from the wall outlet if the set is not to be used for an extended period of time.

Brightness of a subject

Color Video Camera might not work with its best performance in a place where brightness exceeds the illumination range (such as a place exposed to direct sunlight).

Avoid specialized application

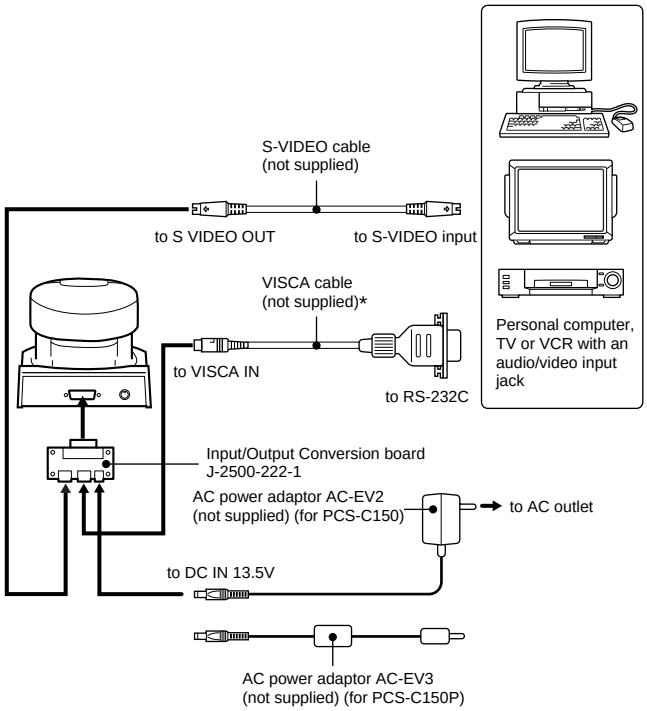
Avoid using Color Video Camera for monitoring application where it would be forced to focus on a stationary object for a long period of time. Also avoid focusing the camera on an extremely bright object such as sunlight or a fluorescent lamp. Otherwise the color filter might be damaged.

Precaution on copyright

Television programs, pictures, magazines, and other materials may be copyrighted. Unauthorized recording or storing of such materials violates the provision of the copyright laws.

Connections

Be sure to use the tool board (J-2500-222-1) to connect to this unit. Connect the power supply, connect the tool board to the unit, and connect the terminals of the tool board to the personal computer, TV, or VCR equipped with an S-Video input. Some connections may require extra cables. Refer to the instructions manual of the equipment to be connected.



* When the video camera is connected to a personal computer with a VISCA cable, you can operate the video camera with the personal computer.

If you have a personal computer or video equipment with the S-Video input

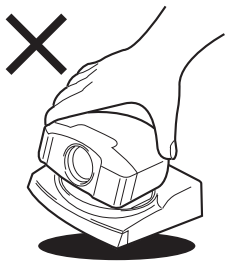
You can connect it to your Color Video Camera with a commercially available S-video cable.

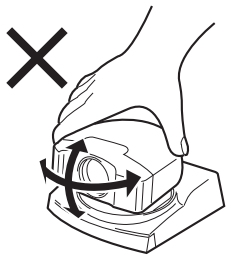
Notes

- You cannot connect your Color Video Camera to a personal computer that is not equipped with S-Video input jack.
  And you might not be able to use your existing personal computer with your Color Video Camera unless you provide the computer with a video capture board and/or software.
  Consult your computer dealer or manufacturer for details.
- To supply power to the tool board, use only the AC power adaptor that has plug of EIAJ type 4 (not supplied). Do not use any other AC power adaptor.

Polarity of the plug

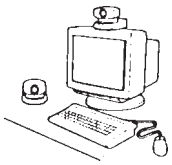
- Do not grasp the camera head when carrying the video camera.
- Do not turn the camera head manually. Doing so will result in the camera malfunctioning.





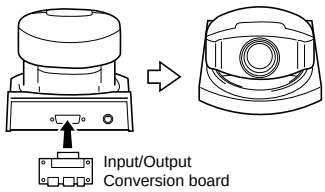
Installation

Be sure to place the main unit on a flat surface.



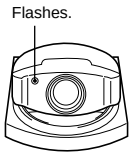
Turning on the Power

When the tool board is connected to this unit and power is supplied to the tool board, it will set into the POWER ON state and the camera will automatically face toward the lower right-hand side and then the front, which is the home position of the camera. (Pan/tilt reset action)



If the lamp at the side of the lens flashes umber

The micro computer inside the camera might not memorize the current pan/tilt position properly. Use Reset command to reset the pan/tilt position.

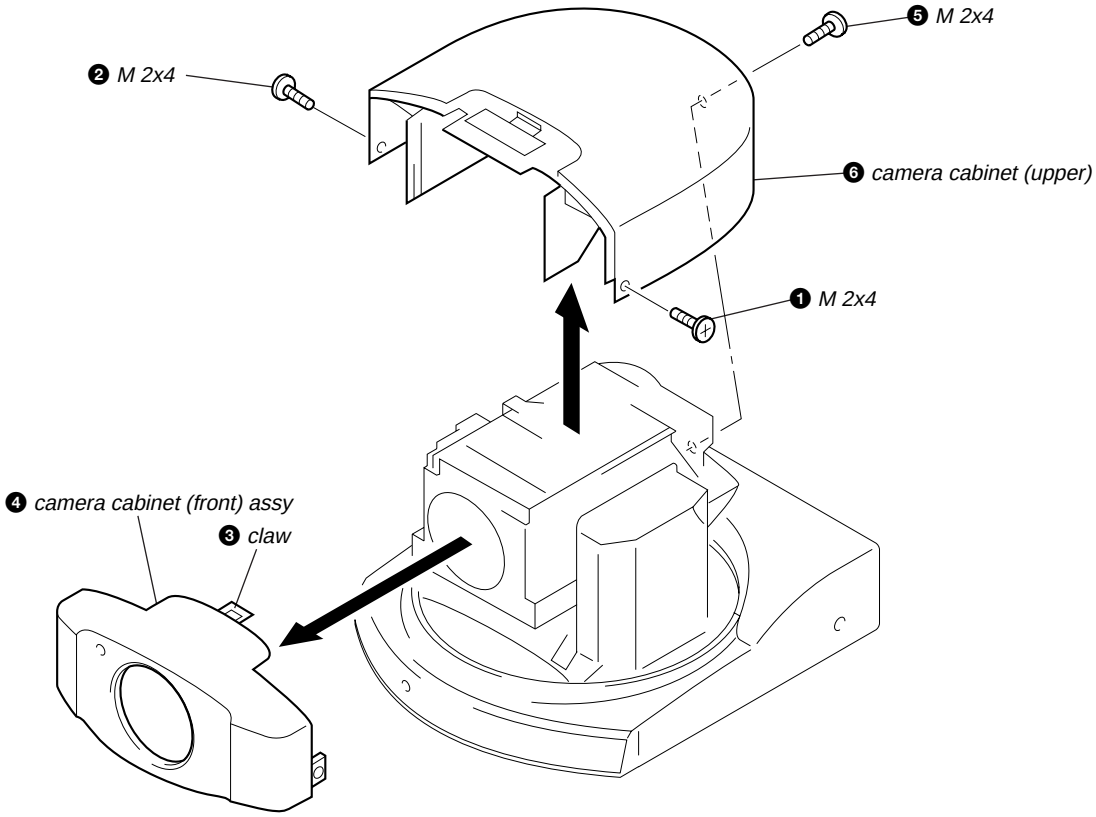


PCS-C150/C150P is controlled by VISCA communication. Refer to VISCA COMMAND LIST.

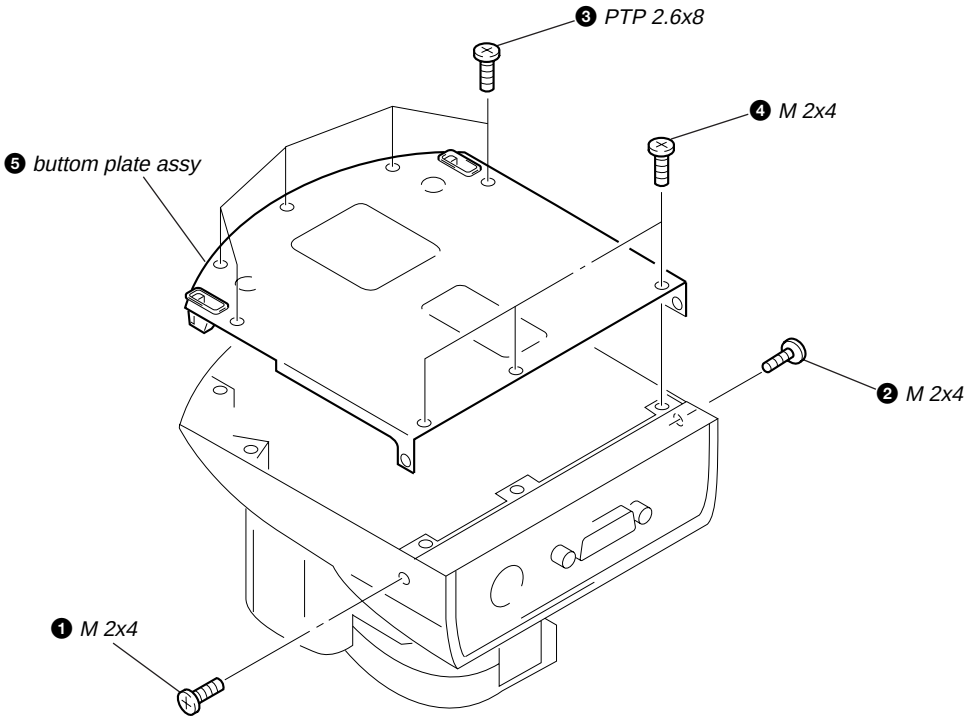
SECTION 2
DISASSEMBLY

Note : Follow the disassembly procedure in the numerical order given.

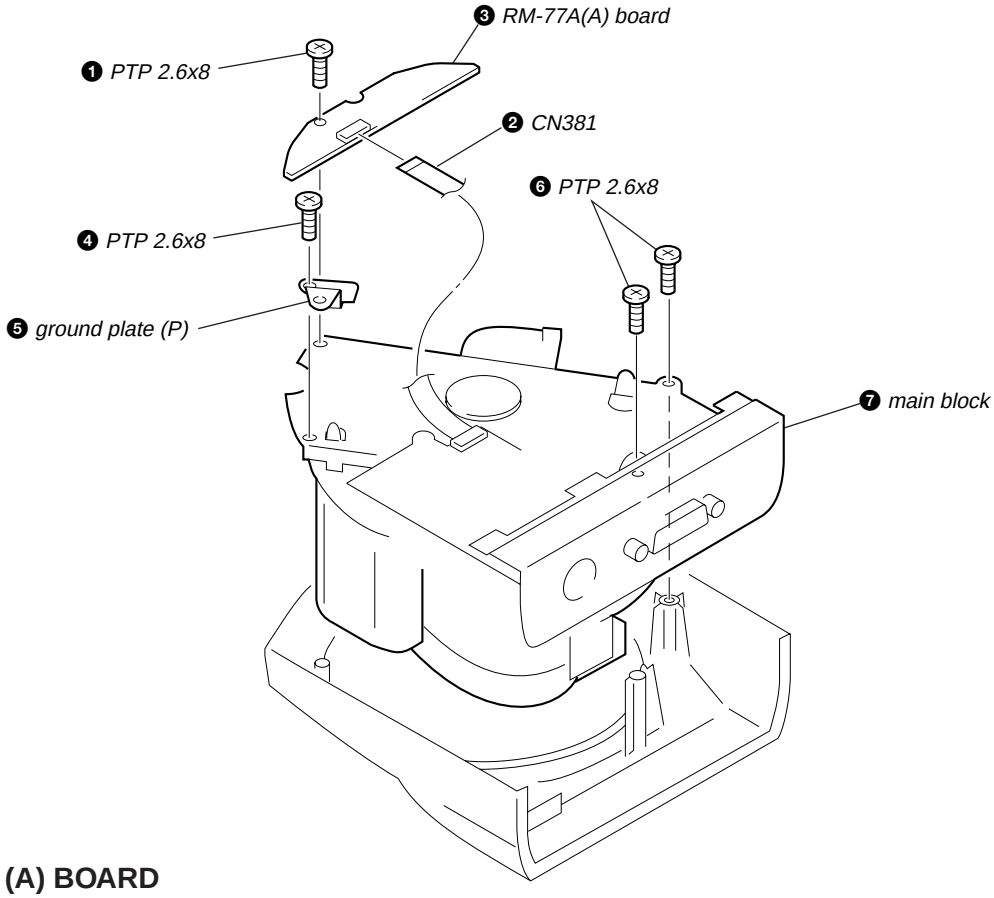
2-1. CAMERA CABINET (UPPER)



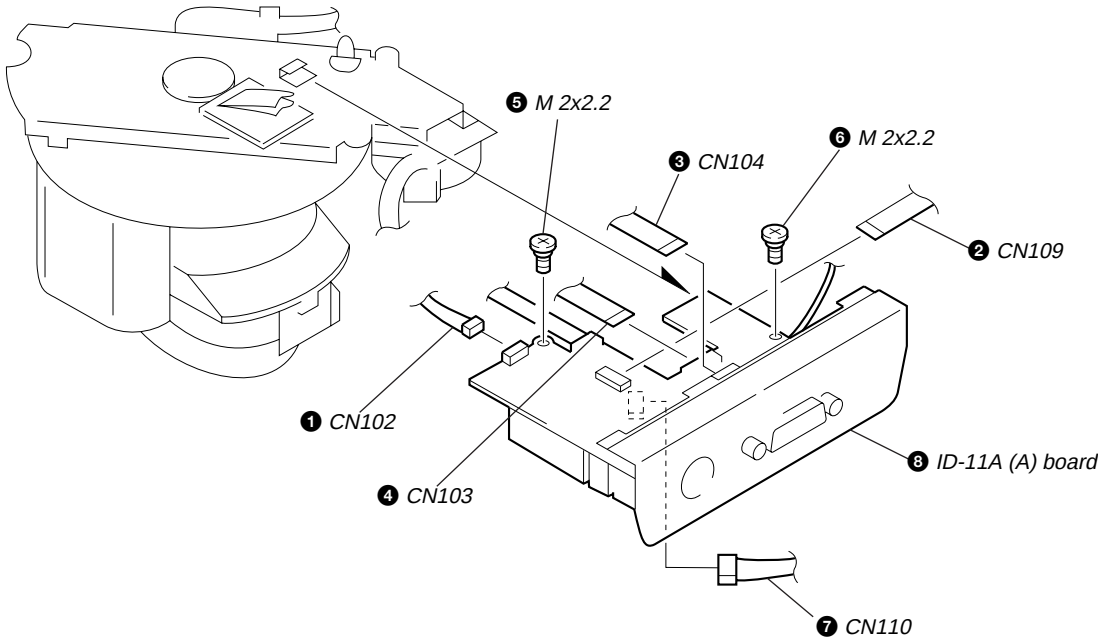
2-2. BOTTOM PLATE ASSY



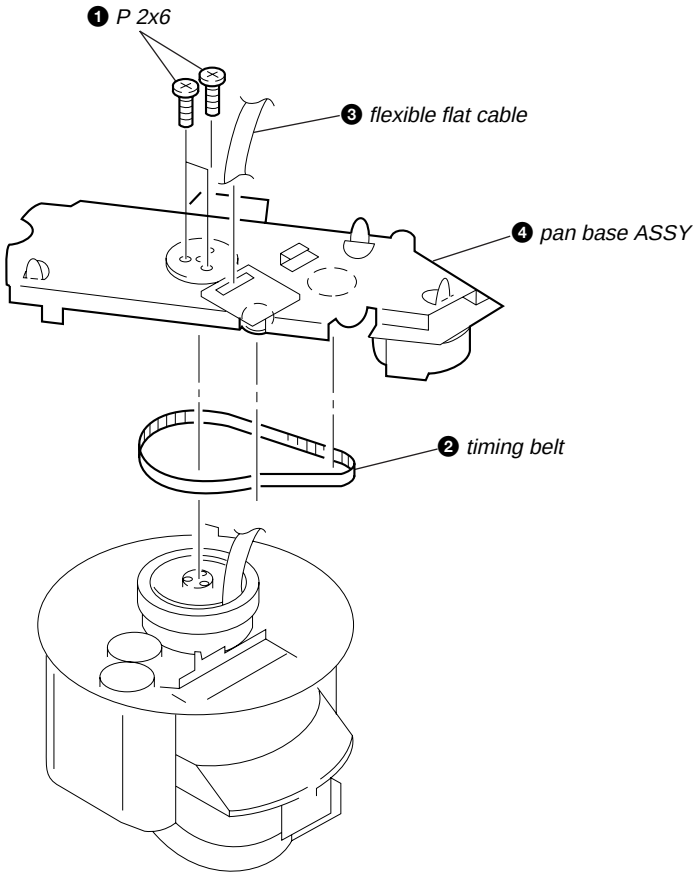
2-3. MAIN BLOCK



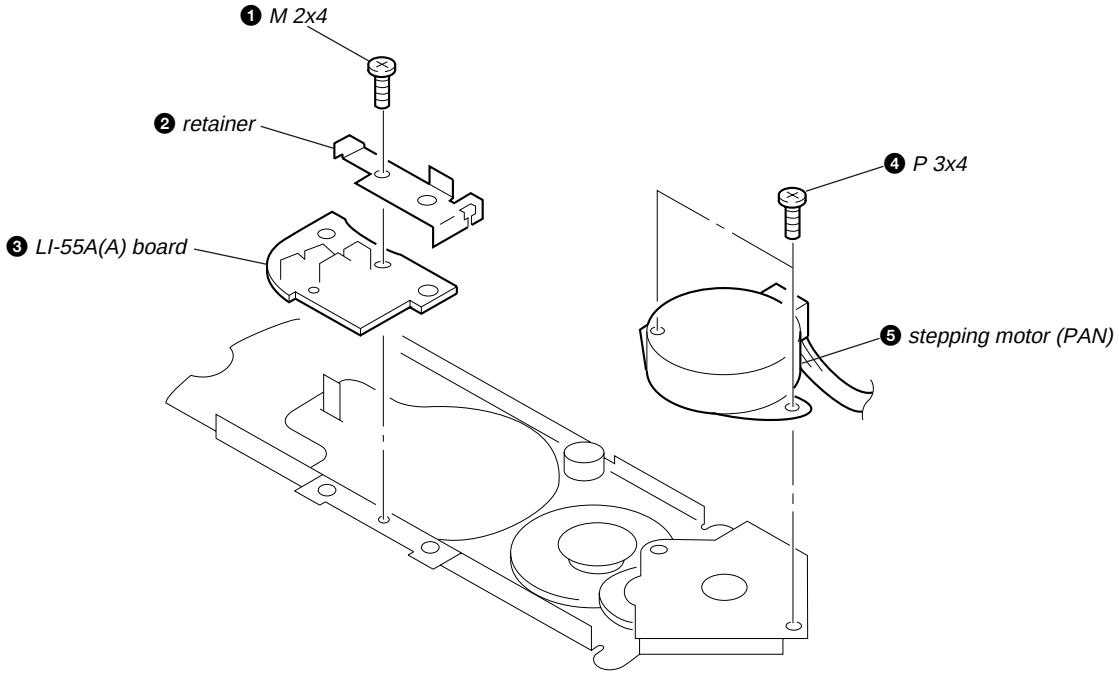
2-4. ID-11A (A) BOARD



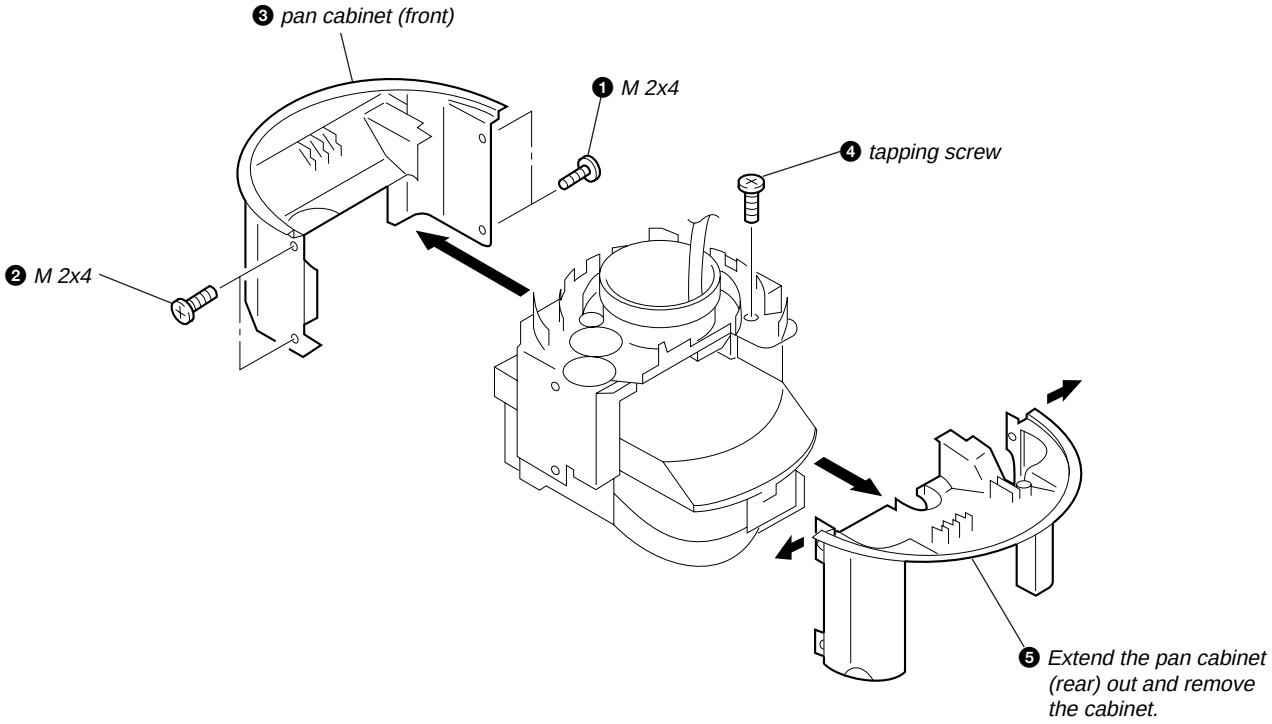
2-5. PAN BASE ASSY



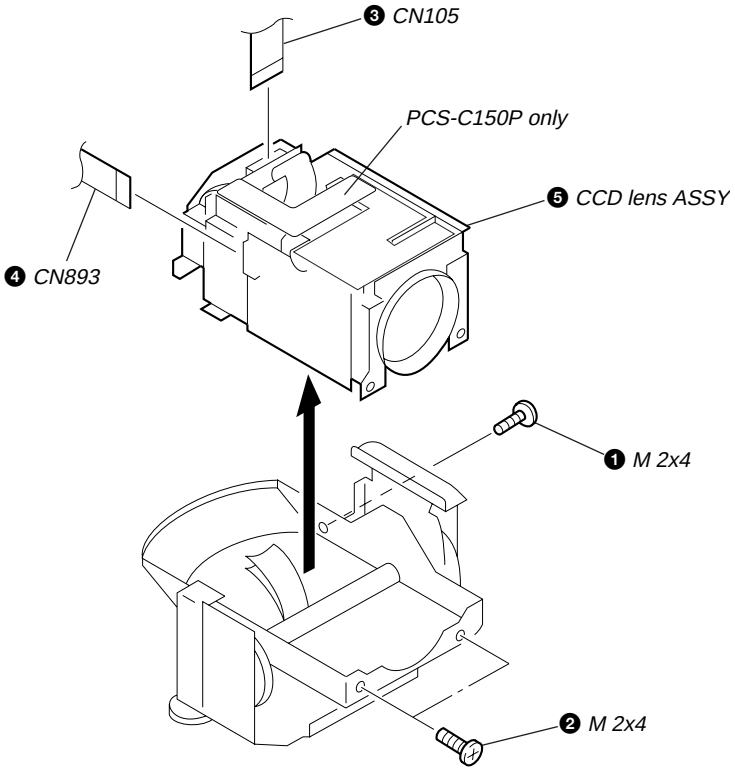
2-6. LI-55A (A) BOARD



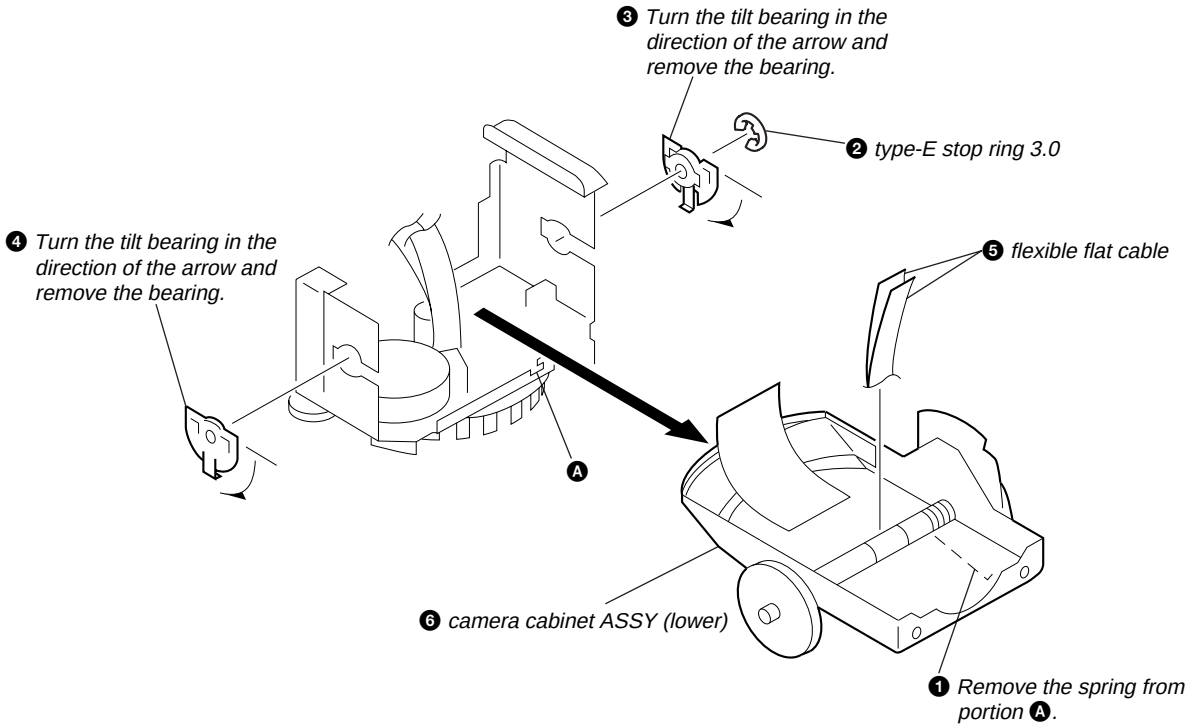
2-7. PAN CABINET



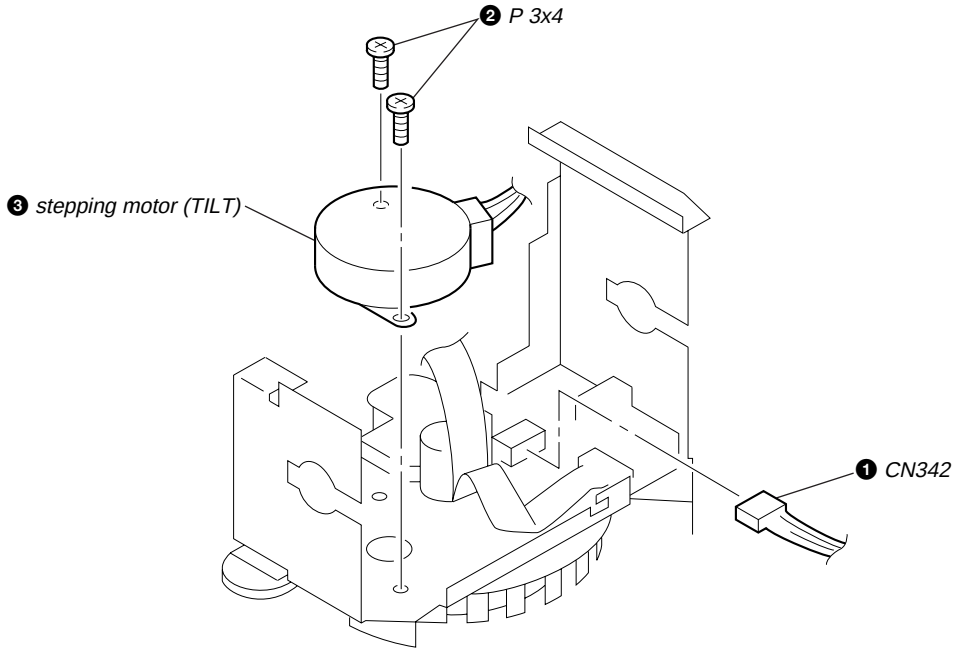
2-8. CCD LENS ASSY



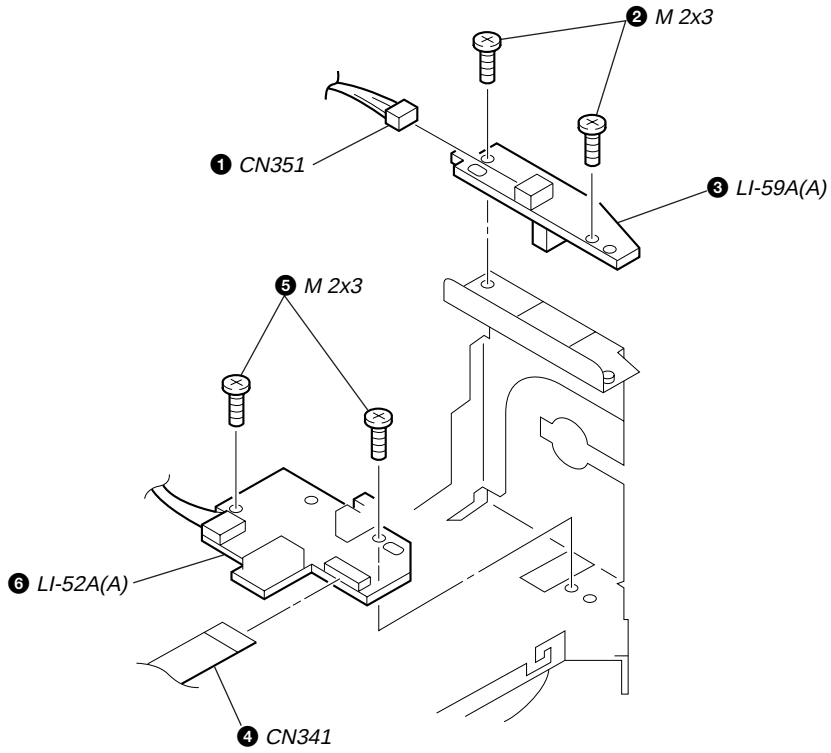
2-9. CAMERA CABINET (LOWER)


❸ Turn the tilt bearing in the direction of the arrow and remove the bearing.
❷ type-E stop ring 3.0
❹ Turn the tilt bearing in the direction of the arrow and remove the bearing.
❺ flexible flat cable
A
❻ camera cabinet ASSY (lower)
❶ Remove the spring from portion A.

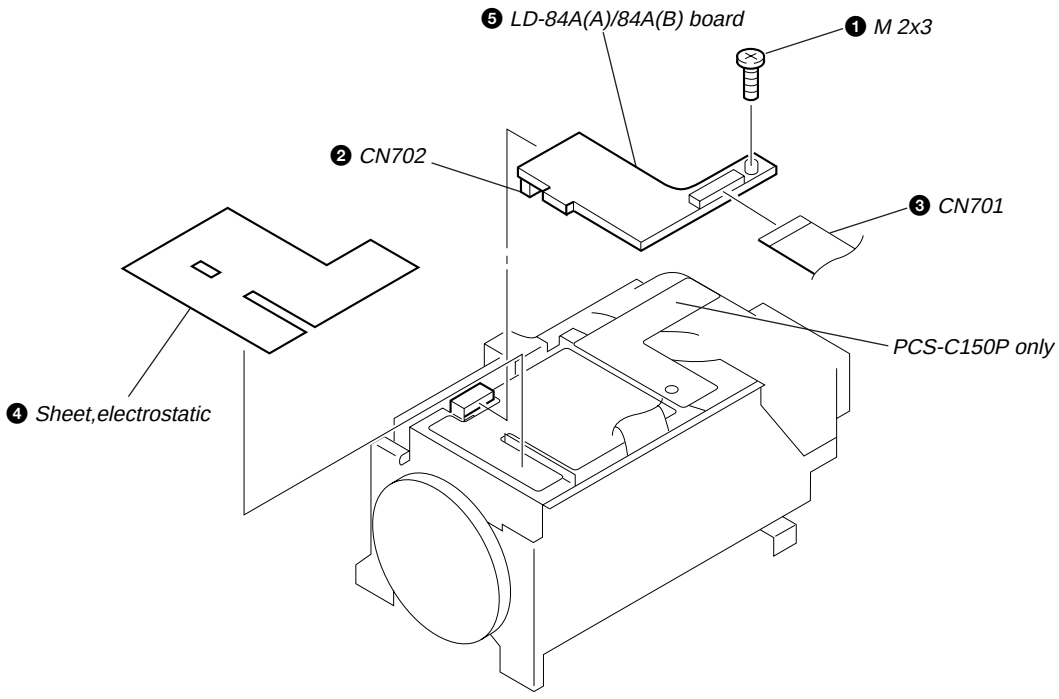
2-10. STEPPING MOTOR



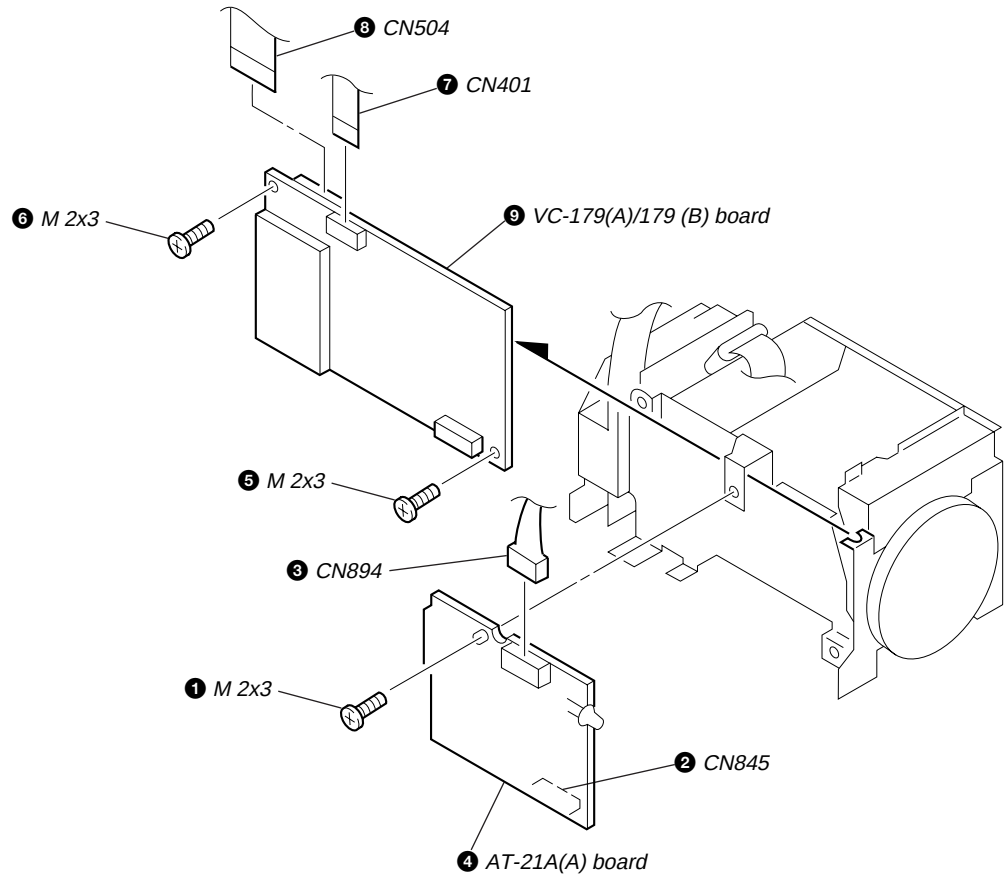
2-11. LI-59A (A) BOARD



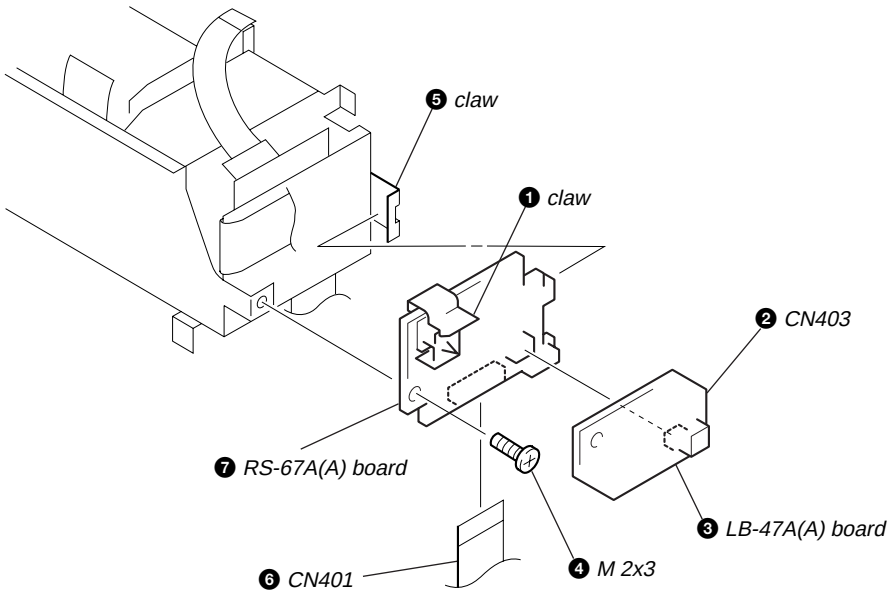
2-12. LD-84A (A)/84A (B) BOARD



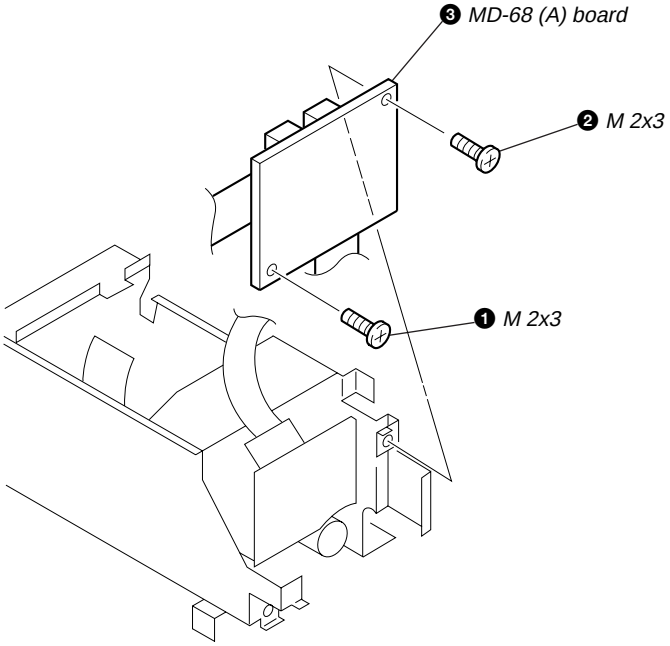
2-13. VC-179 (A)/179 (B) BOARD



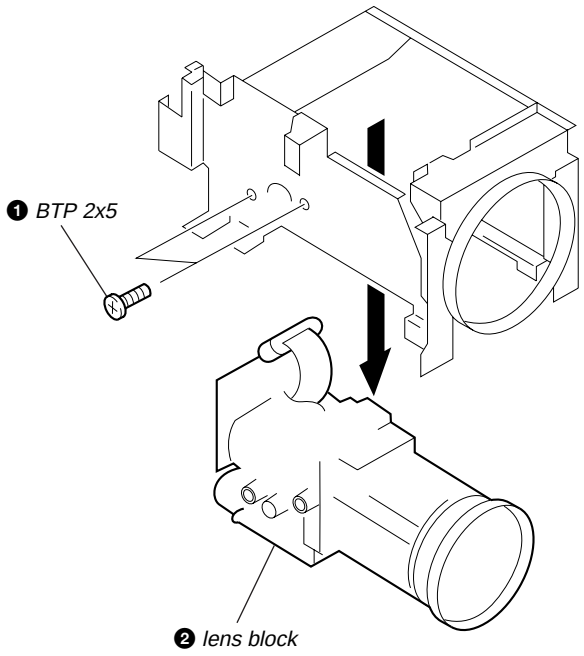
2-14. RS-67A (A)/LB-47A (A) BOARD



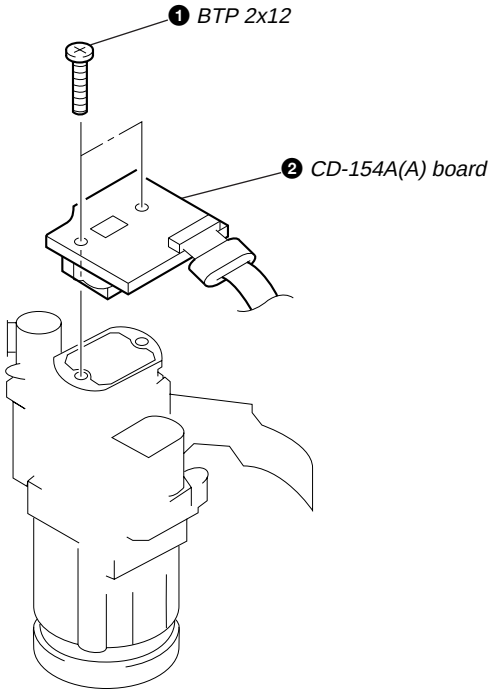
2-15. MD-68 (A) BOARD



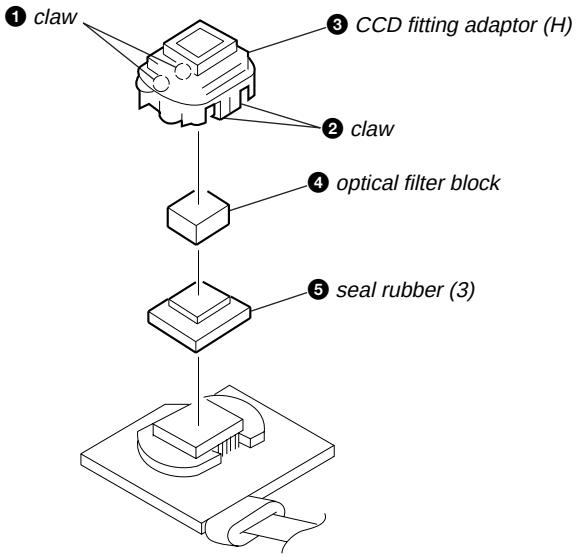
2-16. LENS BLOCK



2-17. CD-154A (A) BOARD

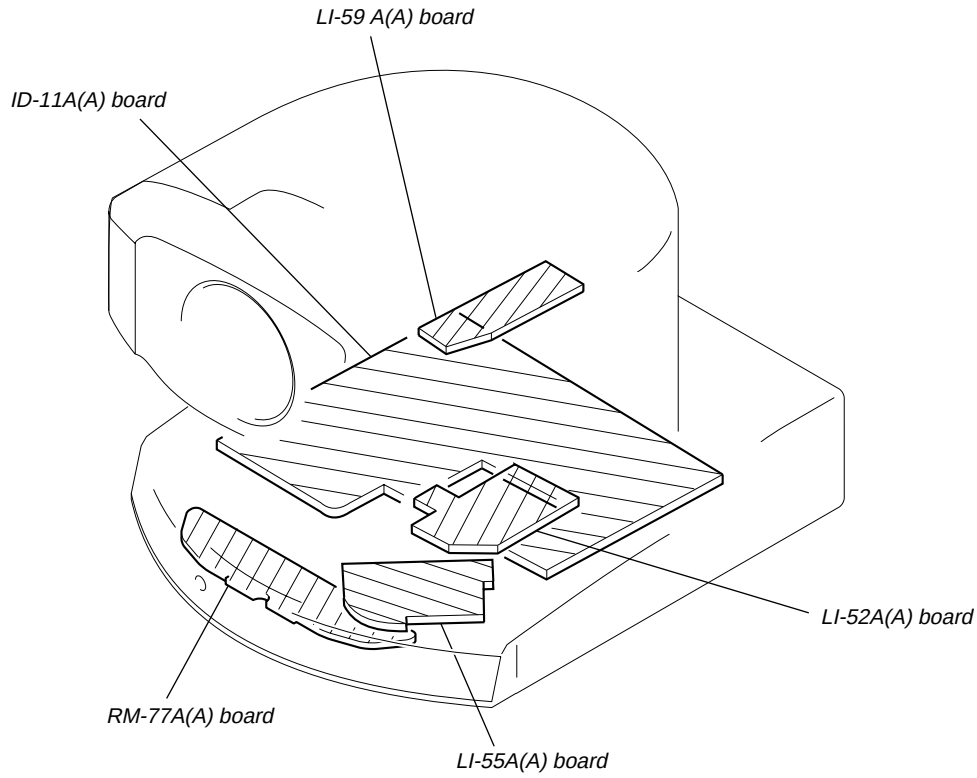


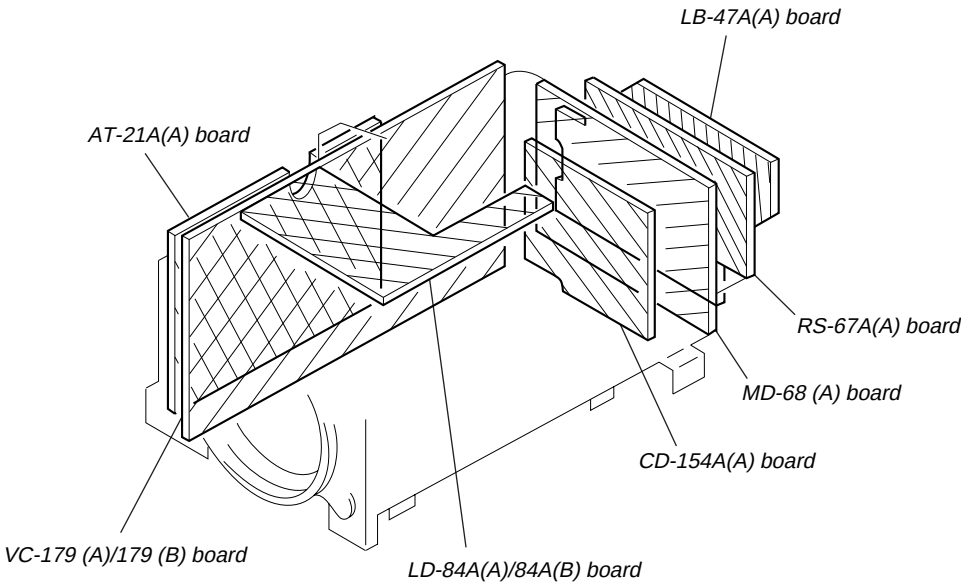
2-18. CCD FITTING ADAPTOR (H)



SECTION 5
PRINTED WIRING BOARDS

5-1. CIRCUIT BOARDS LOCATION





5-2. PRINTED WIRING BOARDS

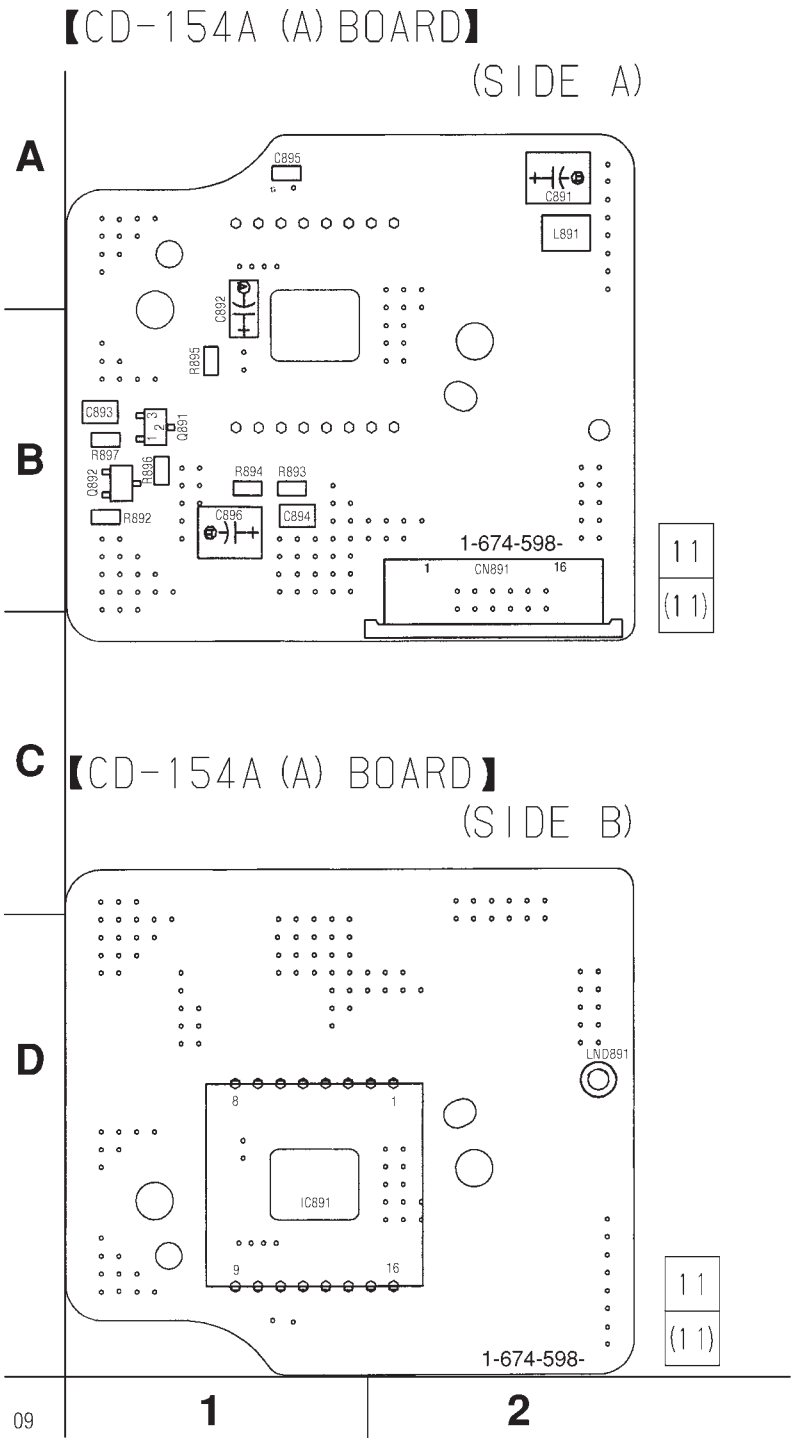
THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS.

- **For printed wiring boards.**

- Through hole is omitted.
- Pattern is omitted.

CD-154A (A) (CCD IMAGER) PRINTED WIRING BOARD

– Ref. No. CD-154A (A) BOARD : 1,000 series –



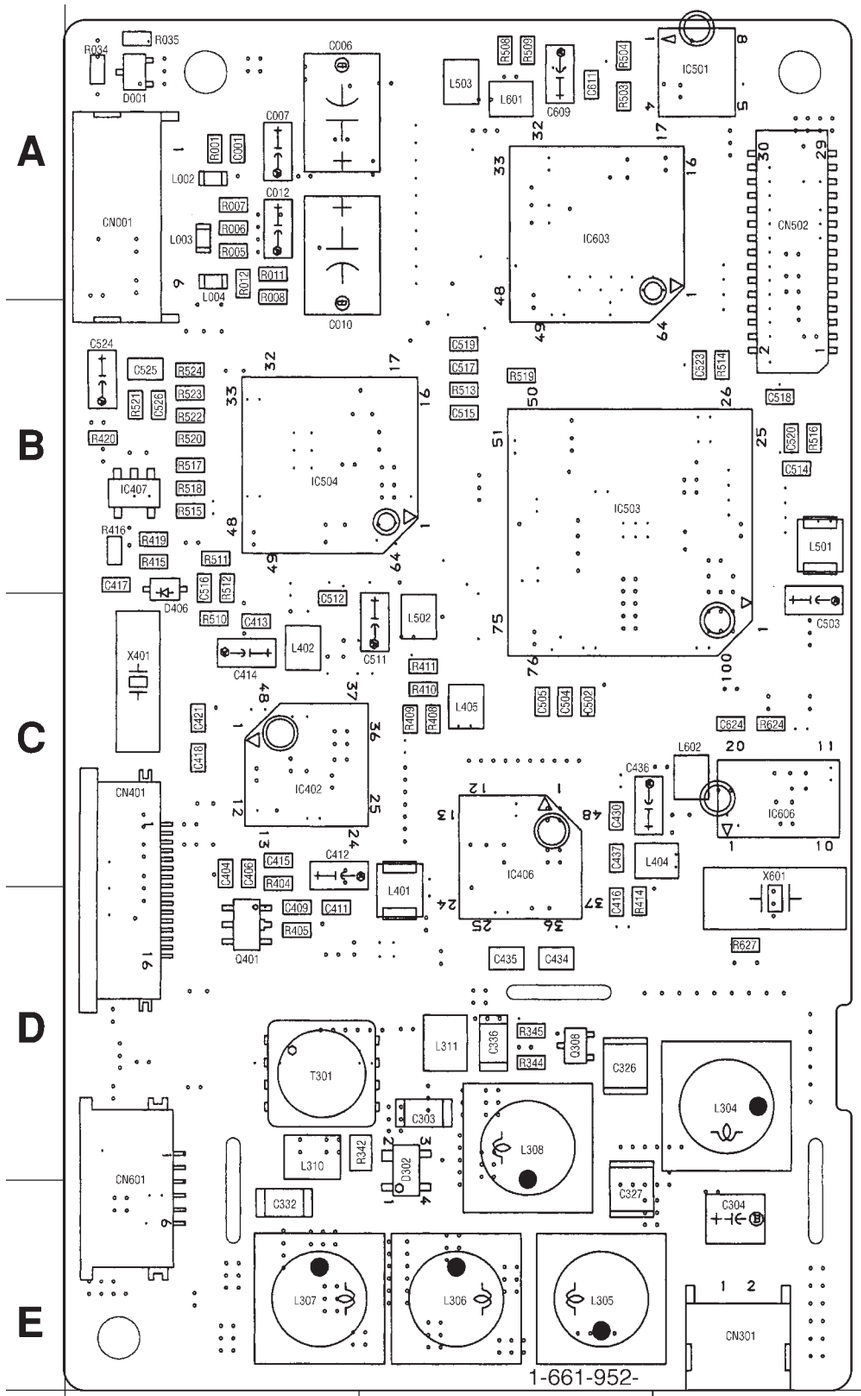
CD-154A (A) BOARD

IC891	D-1
Q891	B-1
Q892	B-1

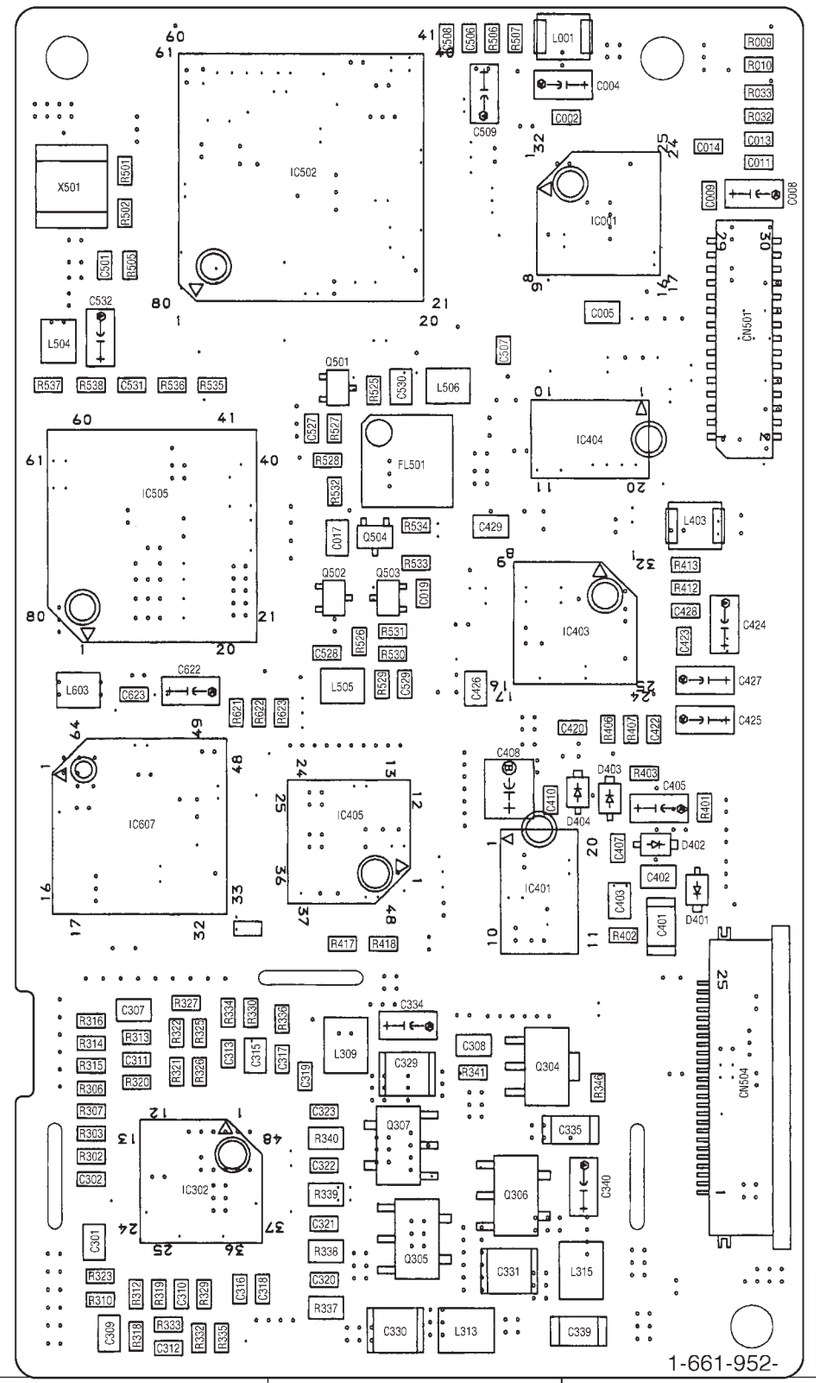
VC-179 (A)/179 (B) (CAMERA) PRINTED WIRING BOARD

– Ref. No. VC-179 (A)/179 (B) BOARD : 1,000 series –

【VC-179 (A)/179 (B) BOARD】(SIDE A)



【VC-179 (A)/179 (B) BOARD】(SIDE B)



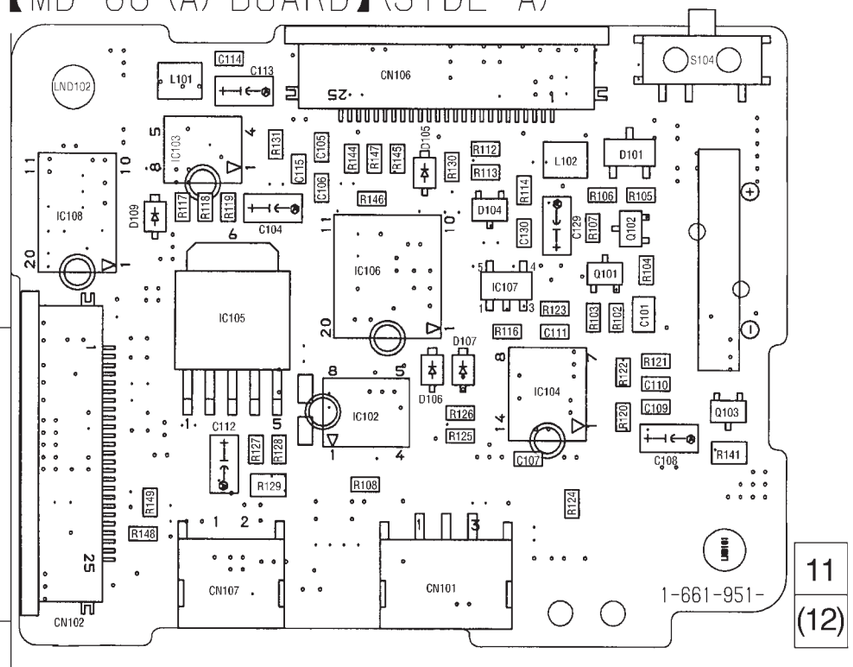
VC-179 (A)/179 (B) BOARD

D001	A-1
D302	D-2
D401	D-6
D402	C-6
D403	C-6
D404	C-6
D406	B-1
IC001	A-6
IC302	E-4
IC401	D-5
IC402	C-1
IC403	C-6
IC404	B-6
IC405	C-5
IC406	C-2
IC407	B-1
IC501	A-3
IC502	A-5
IC503	B-2
IC504	B-1
IC505	B-4
IC603	A-2
IC606	C-3
IC607	C-4
Q304	D-5
Q305	E-5
Q306	E-5
Q307	D-5
Q308	D-2
Q401	D-1
Q502	C-5
Q503	C-5
Q504	B-5
Q601	B-5

MD-68 (A) (MODE CONTROL) RS-67A (A) (BACK UP) PRINTED WIRING BOARDS

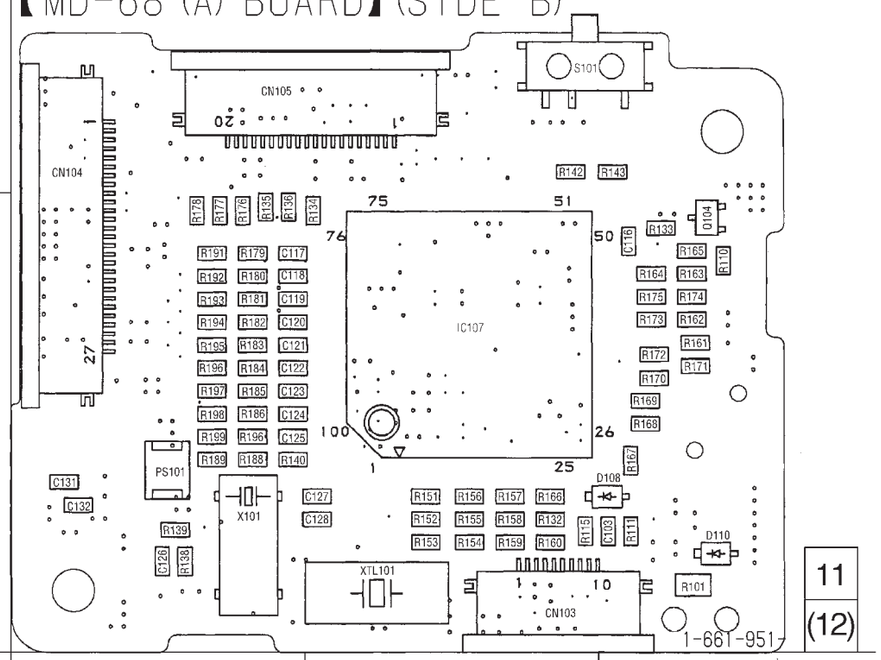
– Ref. MD-68 (A) BOARD : 1,000 series, RS-67A (A) BOARD : 2,000 series –

【MD-68 (A) BOARD】(SIDE A)

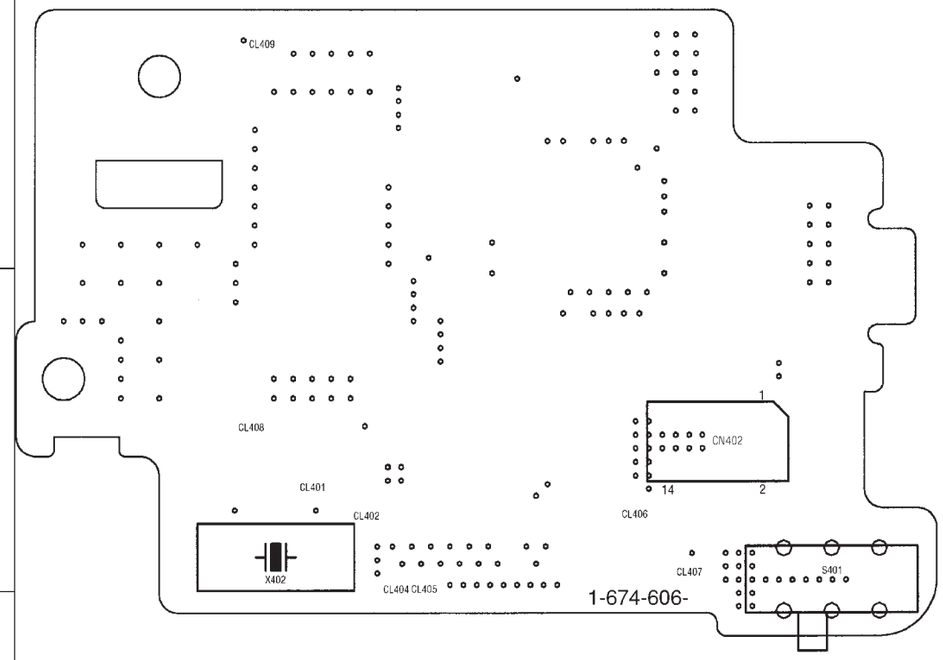


MD-68 (A) BOARD	
D101	A-3
D104	A-2
D105	A-2
D106	B-2
D107	B-2
D108	D-3
D109	A-1
D110	D-3
IC101	D-2
IC102	B-2
IC103	A-1
IC104	B-2
IC105	A-1
IC106	A-2
IC107	A-2
IC108	A-1
Q101	A-2
Q102	A-3
Q103	B-3
Q104	D-3

【MD-68 (A) BOARD】(SIDE B)

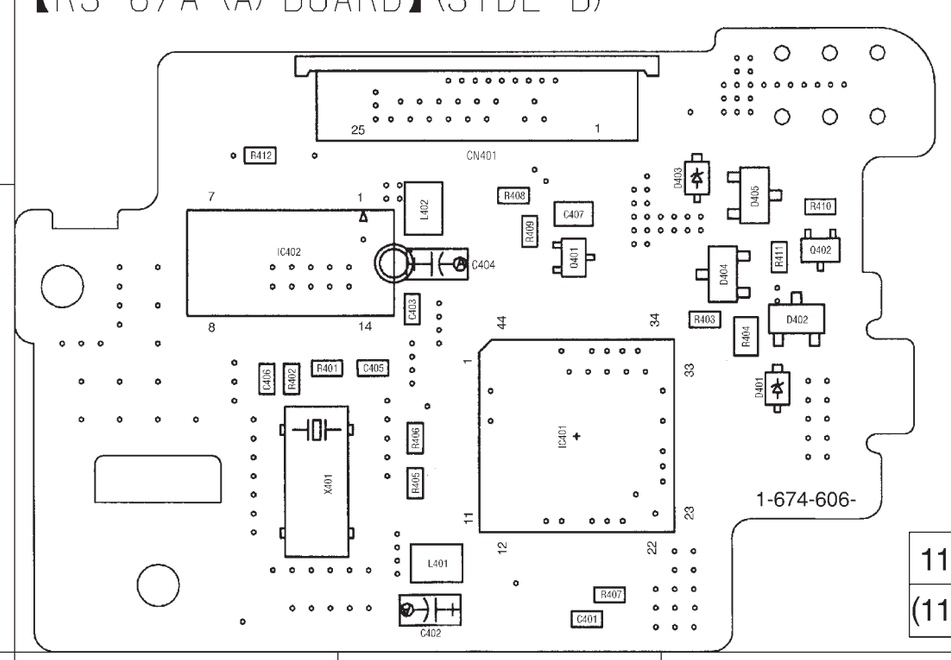


【RS-67A (A) BOARD】(SIDE A)



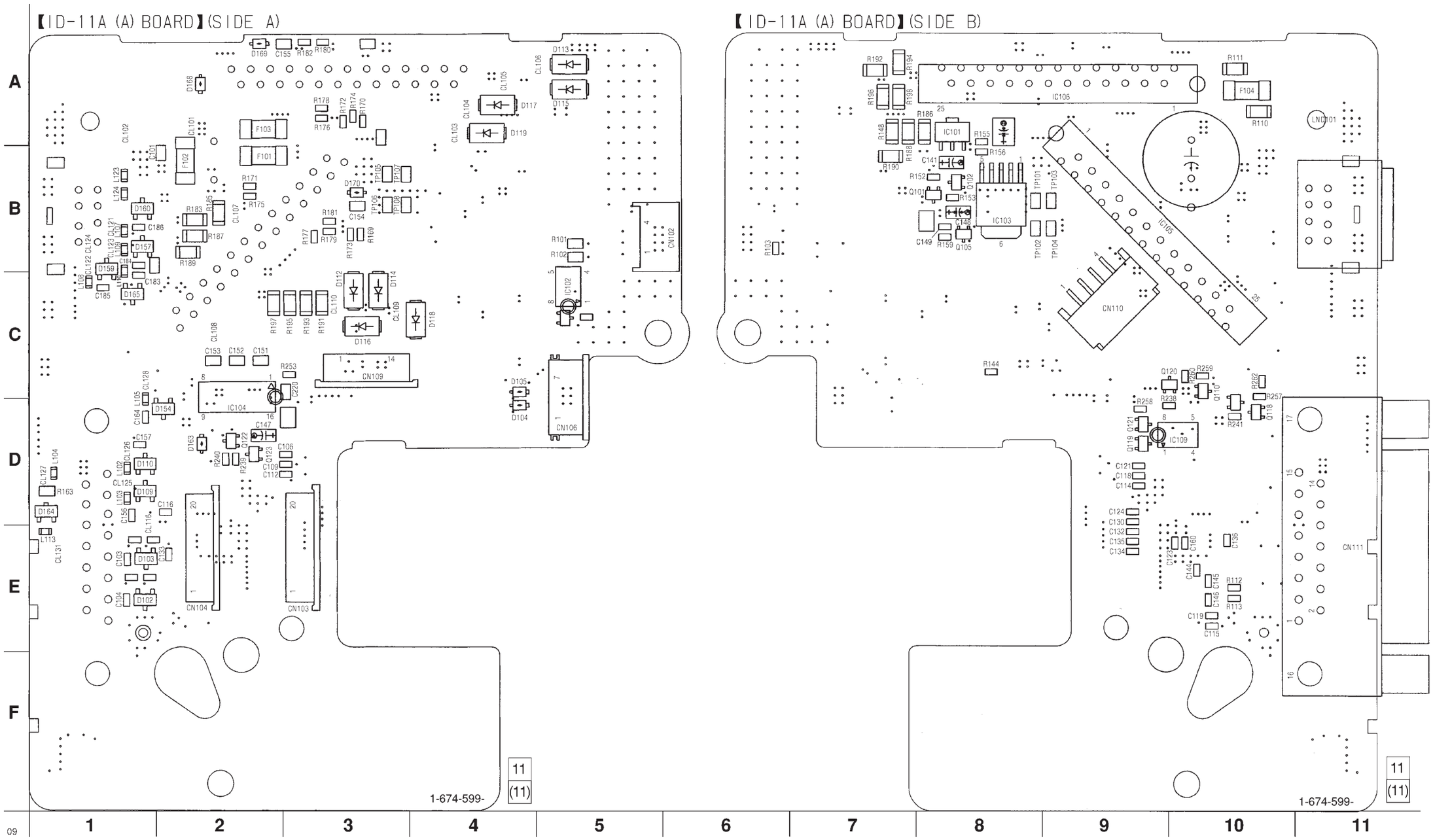
RS-67A (A) BOARD	
D401	D-3
D402	D-3
D403	C-3
D404	D-3
D405	D-3
IC401	D-2
IC402	D-3
Q401	D-2
Q402	D-3

【RS-67A (A) BOARD】(SIDE B)



ID-11A (A) (MOTOR DRIVE, INPUT/OUTPUT) PRINTED WIRING BOARDS

– Ref. No. ID-11A (A) BOARD : 2,000 series



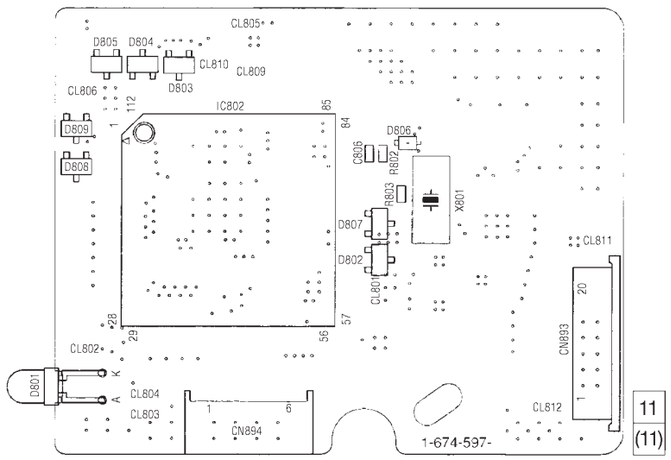
ID-11A (A)/11A (A) BOARD

D102	E-1
D103	E-1
D104	D-4
D105	C-4
D109	D-1
D110	D-1
D112	C-3
D113	A-5
D114	C-3
D115	A-5
D116	C-3
D117	A-4
D118	C-4
D119	A-4
D154	D-2
D157	B-1
D159	B-1
D160	B-1
D163	D-2
D164	D-1
D165	C-1
D168	A-2
D169	A-2
D170	B-3
IC101	A-8
IC102	C-5
IC103	B-8
IC104	C-2
IC105	B-9
IC106	A-9
IC109	D-9
Q101	B-8
Q102	B-8
Q105	B-8
Q110	C-10
Q118	D-10
Q119	D-9
Q120	C-9
Q121	D-9
Q122	D-2
Q123	D-2

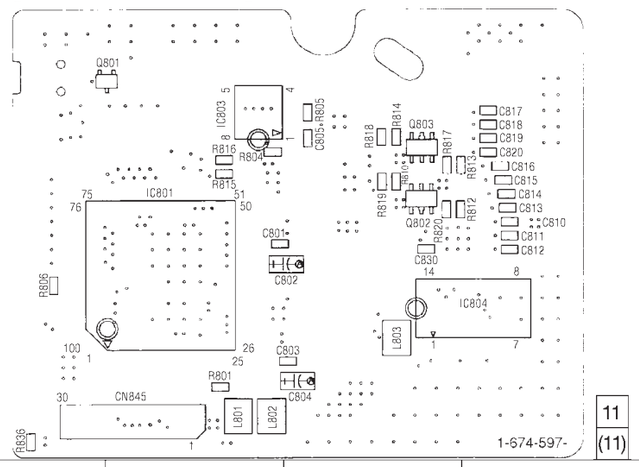
AT-21A (A) (VIDEO PROCESS, MAIN CONTROL) LI-52A (A) (TILT END SENSOR) LI-59A (A) (TILT R SENSOR) LI-55A (A) (PAN R SENSOR) PRINTED WIRING BOARDS

– Ref. No. AT-21A (A) BOARD : 1,000 series, LI-52A (A) BOARD : 2,000 series, LI-55A (A) BOARD : 2,000 series, LI-59A (A) BOARD : 2,000 series –

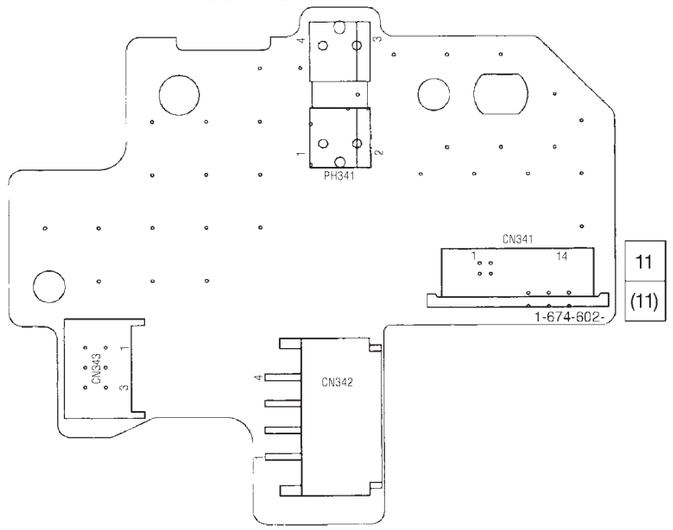
【AT-21A (A) BOARD】(SIDE A)



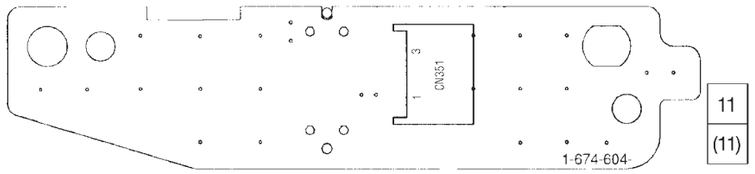
【AT-21A (A) BOARD】(SIDE B)



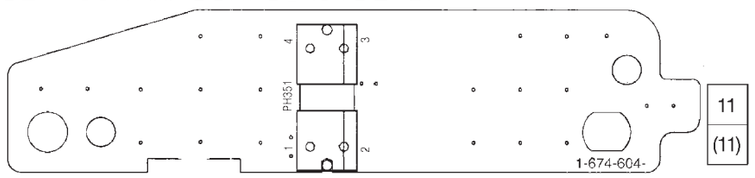
【LI-52A (A) BOARD】



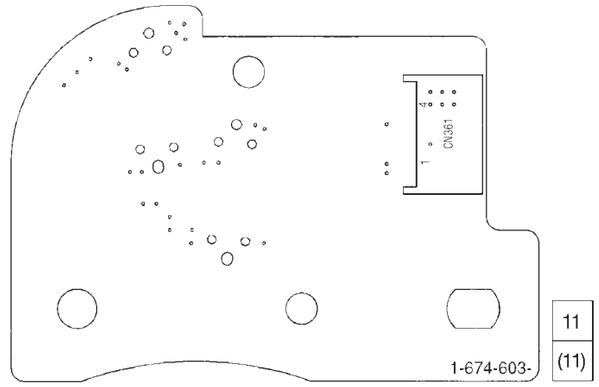
【LI-59A (A) BOARD】(SIDE A)



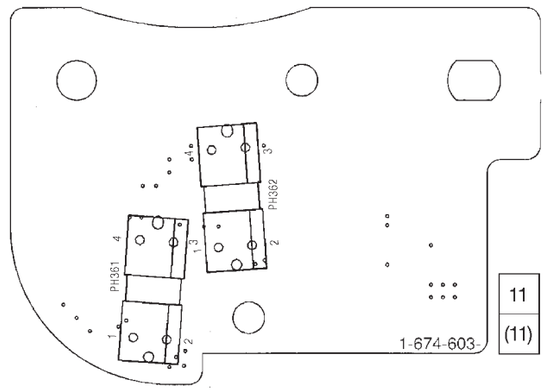
【LI-59A (A) BOARD】(SIDE B)



【LI-55A (A) BOARD】(SIDE A)



【LI-55A (A) BOARD】(SIDE B)

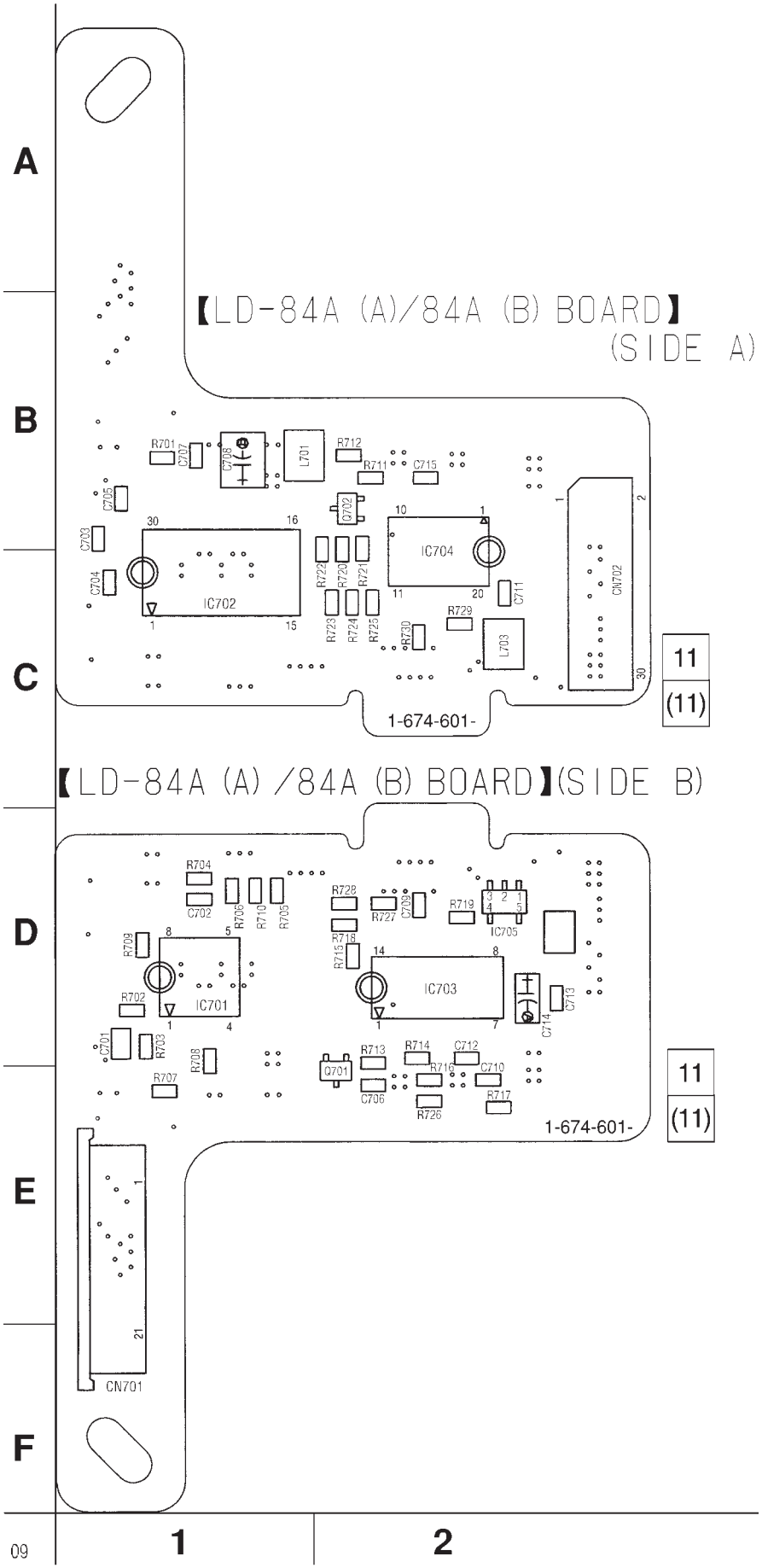


AT-21A (A) BOARD

D801	C-1
D802	B-3
D803	A-2
D804	A-1
D805	A-1
D806	A-3
D807	B-3
D808	B-1
D809	A-1
IC801	E-2
IC802	B-2
IC803	D-2
IC804	E-4
Q801	D-2
Q802	E-3
Q803	D-3

LD-84A (A)/84A (B) (LENS DRIVE) PRINTED WIRING BOARD

– Ref. No. LD-84A (A)/84A (B) BOARD : 2,000 series –



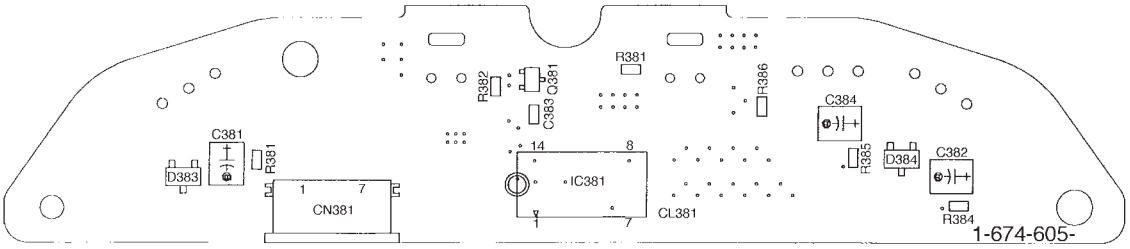
LD-84 A (A)/84A (B) BOARD

IC701	D-1
IC702	C-1
IC703	D-2
IC704	C-2
IC705	D-2
Q701	E-2
Q702	B-2

RM-77A (A) (REMOCON RECEIVING OPTICAL), LB-47A (A) (BATTERY) PRINTED WIRING BOARD

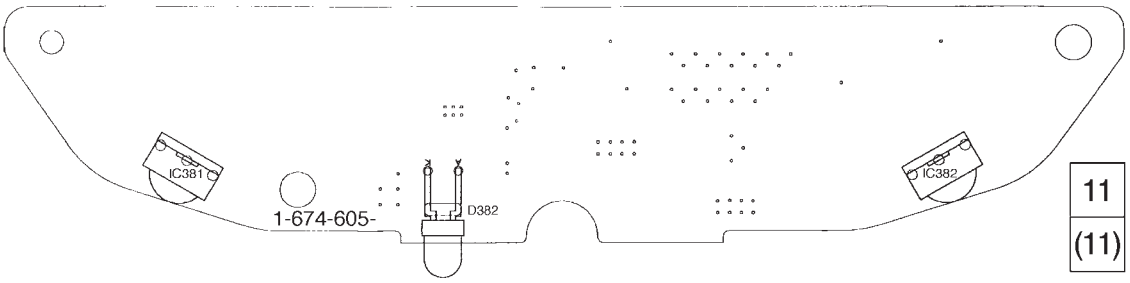
– Ref. No. RM-77A BOARD : 1,000 series, LB-47A (A) BOARD : 1,000 series –

【RM-77A (A) BOARD】(SIDE A)



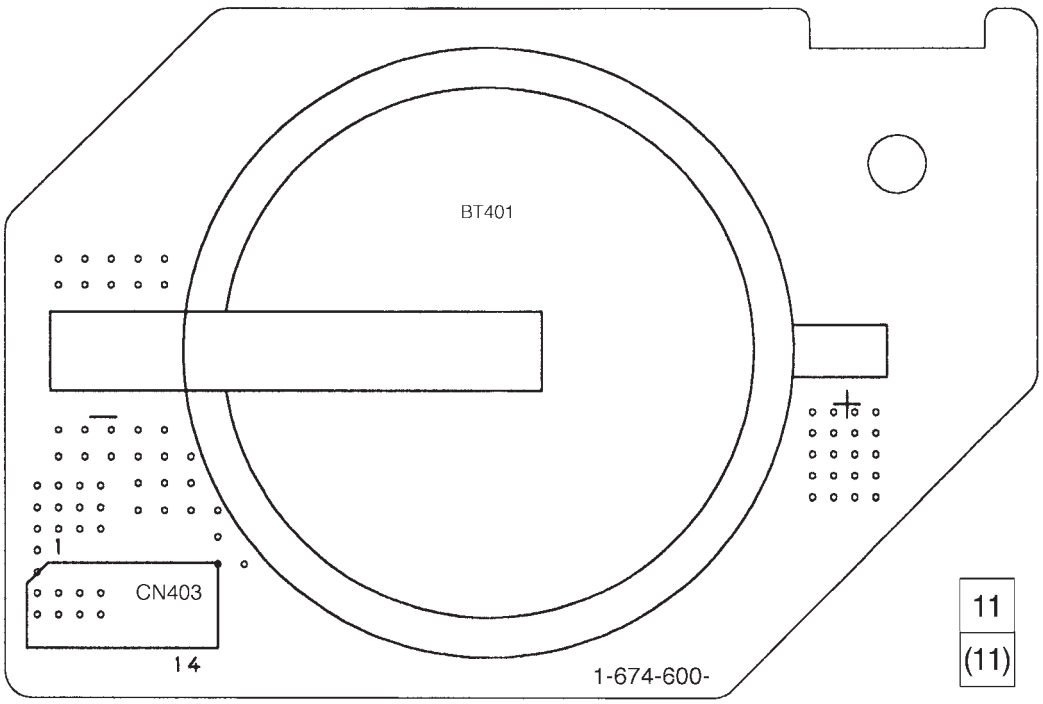
11
(11)

【RM-77A (A) BOARD】(SIDE B)



11
(11)

【LB-47A (A) BOARD】



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(11)

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SECTION 6
ADJUSTMENTS

6-1. PREPARATION FOR ADJUSTMENT

6-1-1. List of Servicing Jigs

• Oscilloscope • Regulated power supply • Audio generator • Audio level meter
• Color monitor • Vectorscope • Desk-top calculator • Digital voltmeter

Ref. No.	Name	Part No.	Use
J-1	Filter for color temperature correction (C14)	J-6080-058-A	Auto white balance adjustment/check White balance adjustment/check
J-2	ND filter 1.0	J-6080-808-A	White balance check
	ND filter 0.3	J-6080-818-A	White balance check
J-3	Pattern box PTB-450	J-6082-200-A	
J-4	Color chart for pattern box	J-6020-250-A	
J-5	Siemens star	J-6080-875-A	For checking the flange back
J-6	Extension cable (30P, 0.8mm)	J-6082-189-A	For extension between LD-84A (A)/84A (B) board (CN702) and VC-179 (A)/179 (B) board (CN501), AT-21A (A) board (CN845) and VC-179 (A)/179 (B) board (CN502).
J-7	Adjusting remote commander (*1) (RM-95 remodeled partly)	J-6082-053-B	
J-8	Extension cable 3	J-6082-291-A	For adjusting remote commander (J-7)
J-9	Video/S video out cable	J-6082-293-A	For checking the video signal
J-10	DC-57 harness (2P)	1-951-473-11	For DC-supply to VC-179 (A)/179 (B) board (CN301)
J-11	RS-232C cable (8P DIN-8P DIN)	1-590-879-11	For connection between processor terminal and Macintosh PC
J-12	RS-232C cable (8P DIN-25P DSUB)	1-751-195-11 SMF-532A (79-6363-00)	For connection between processor terminal and NEC PC98
J-13	RS-232C cable (8P DIN-9P DSUB female)	1-690-391-21 SMF-533 (48-5233-00)	For connection between processor terminal and IBM PC, Quarter-L
J-14	VISCA Control Software	J-6082-297-A	For IBM PC/NEC PC98
		J-6082-296-A	For Macintosh PC
	AC Adaptor	1-473-789-11	AC-EV2 (AC120V)
	(Output voltage: 13.5Vdc)	1-473-790-11	AC-EV3 (AC220-230V)
J-15	Input/Output conversion board	J-2500-222-1	D SUB Video/VISCA Conversion (*2)

*1 Microcomputer IC in the adjusting remote commander except for µPD7503G-C56-12 (8-759-148-35) does not allow the page selecting. Replace the microcomputer in such a case.
*2 Remove the hexagonal screws of the D-SUB on the board before using the tool board.

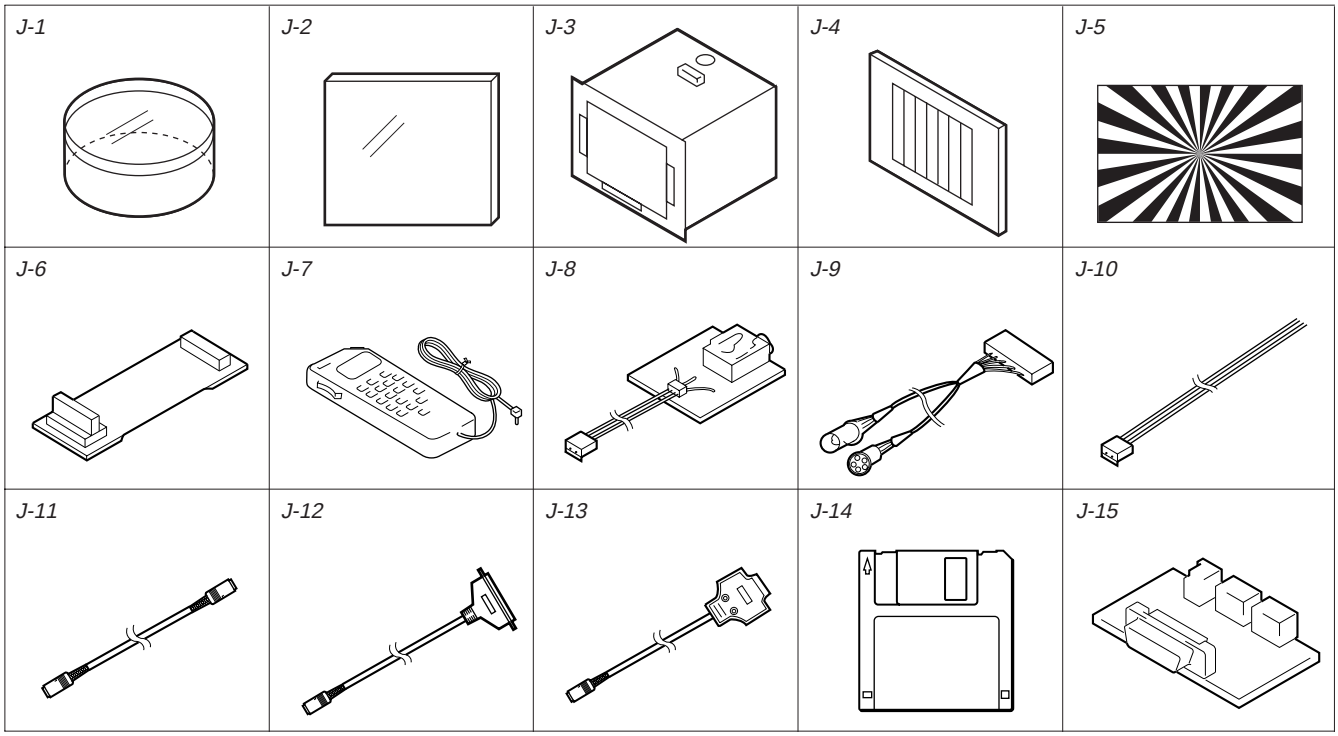


Fig. 6-1.

6-1-2. Preparations

Note: When adjusting only, it is not needed to remove the camera block from the pan tilt mechanism chassis.
The adjustments can be performed only by removing the camera cabinet.

1) Connect the equipments for adjusting as shown in Fig. 6-3.
2) Turning OFF the auto focus using the adjusting remote commander.
   1. Set data: 01 to page: 6, address: 25.
   (The auto focus will turn OFF. The focus can be adjusted using the focus button on the adjusting remote commander. But the HOLD switch must be set to OFF.)
   2. After completing the adjustment/operation check, set data: 00 to page: 6, address: 25.
3) To adjust the camera block only, there are two procedures.
   1. Adjust with the camera block mounted to the pan tilt mechanism chassis. (Fig. 6-2 (1), Fig. 6-3 (1))
   Note: AT-21A (A) board must be removed before 28MHz original oscillation adjustment can be performed.
   2. Remove the camera block from the pan tilt mechanism chassis and perform adjustment to the camera block only. (Fig. 6-2 (2), Fig. 6-3 (2))
   Note: Be sure to change the data of page: D, address: 01 to 00 (NTSC) or 01 (PAL). Then, remove the camera block from the pan tilt mechanism chassis.
   After this adjustment, be sure to perform the operation described in 6-2-20 and 6-2-22.

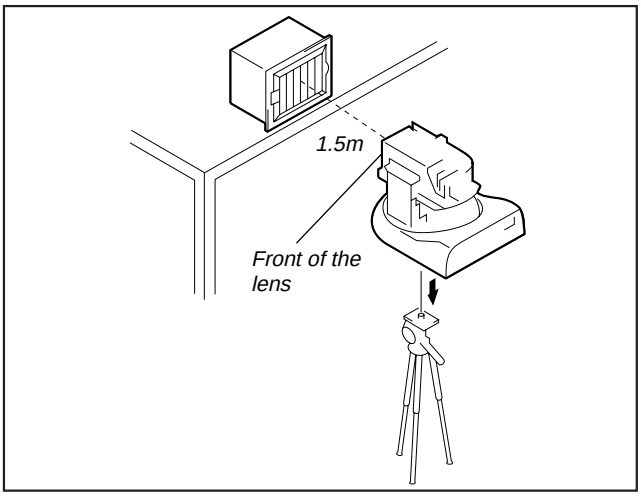


Fig. 6-2 (1) .

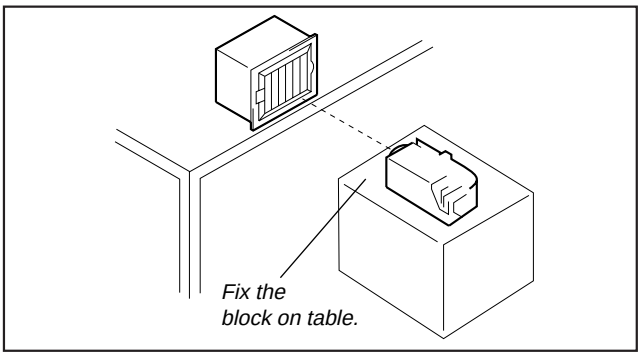


Fig. 6-2 (2) .

Note: The camera block has no screw plate for tripod. So, fix the block on a table when adjusting.

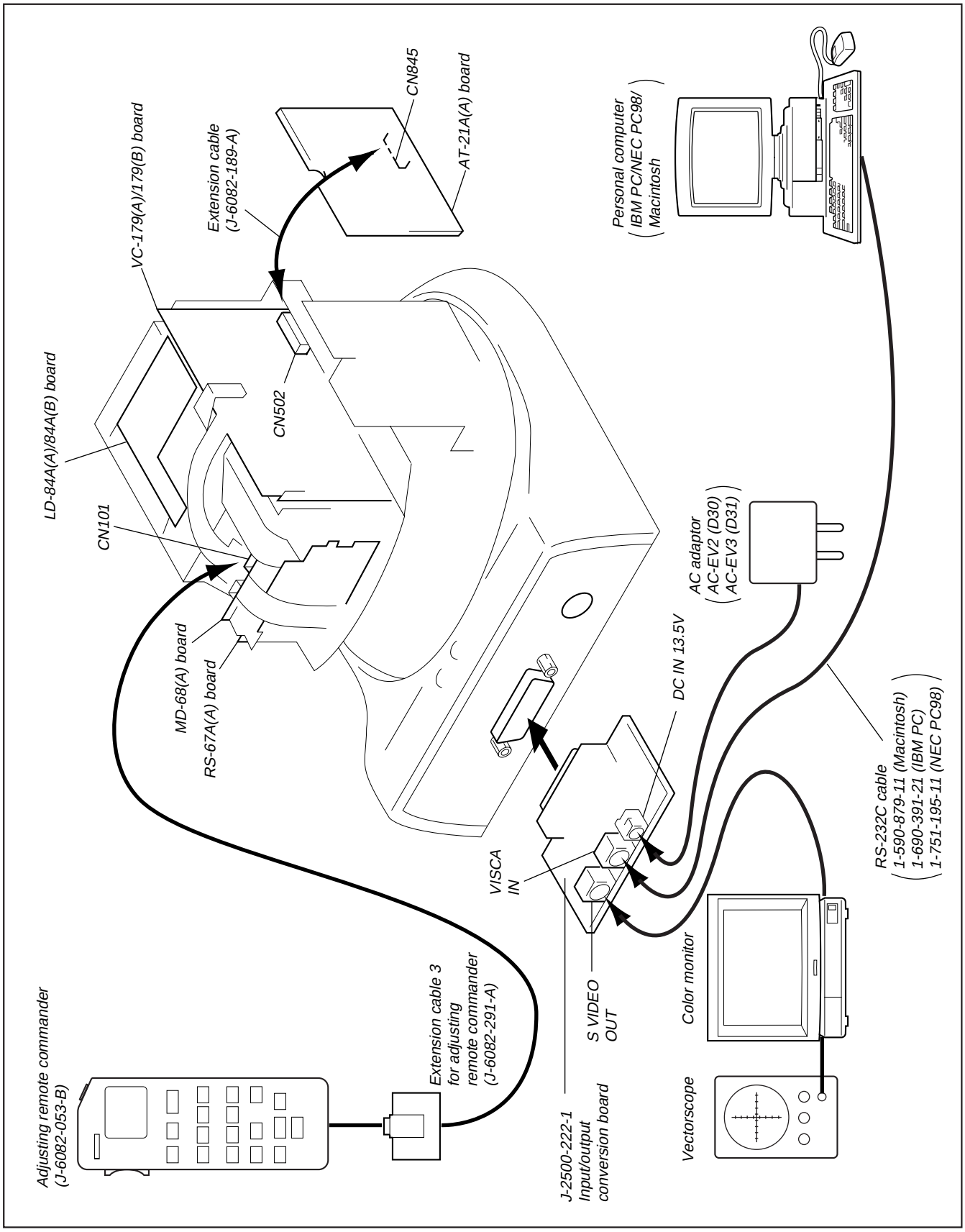

Adjusting remote commander
(J-6082-053-B)
Extension cable 3
for adjusting
remote commander
(J-6082-291-A)
J-2500-222-1
Input/output
conversion board
S VIDEO
OUT
VISCA
IN
DC IN 13.5V
Vectorscope
Color monitor
AC adaptor
AC-EV2 (D30)
AC-EV3 (D31)
RS-232C cable
1-590-879-11 (Macintosh)
1-690-391-21 (IBM PC)
1-751-195-11 (NEC PC98)
Personal computer
IBM PC/NEC PC98/
Macintosh
MD-68(A) board
RS-67A(A) board
CN101
LD-84A(A)/84A(B) board
VC-179(A)/179(B) board
CN502
Extension cable
(J-6082-189-A)
CN845
AT-21A(A) board

Fig. 6-3 (1).

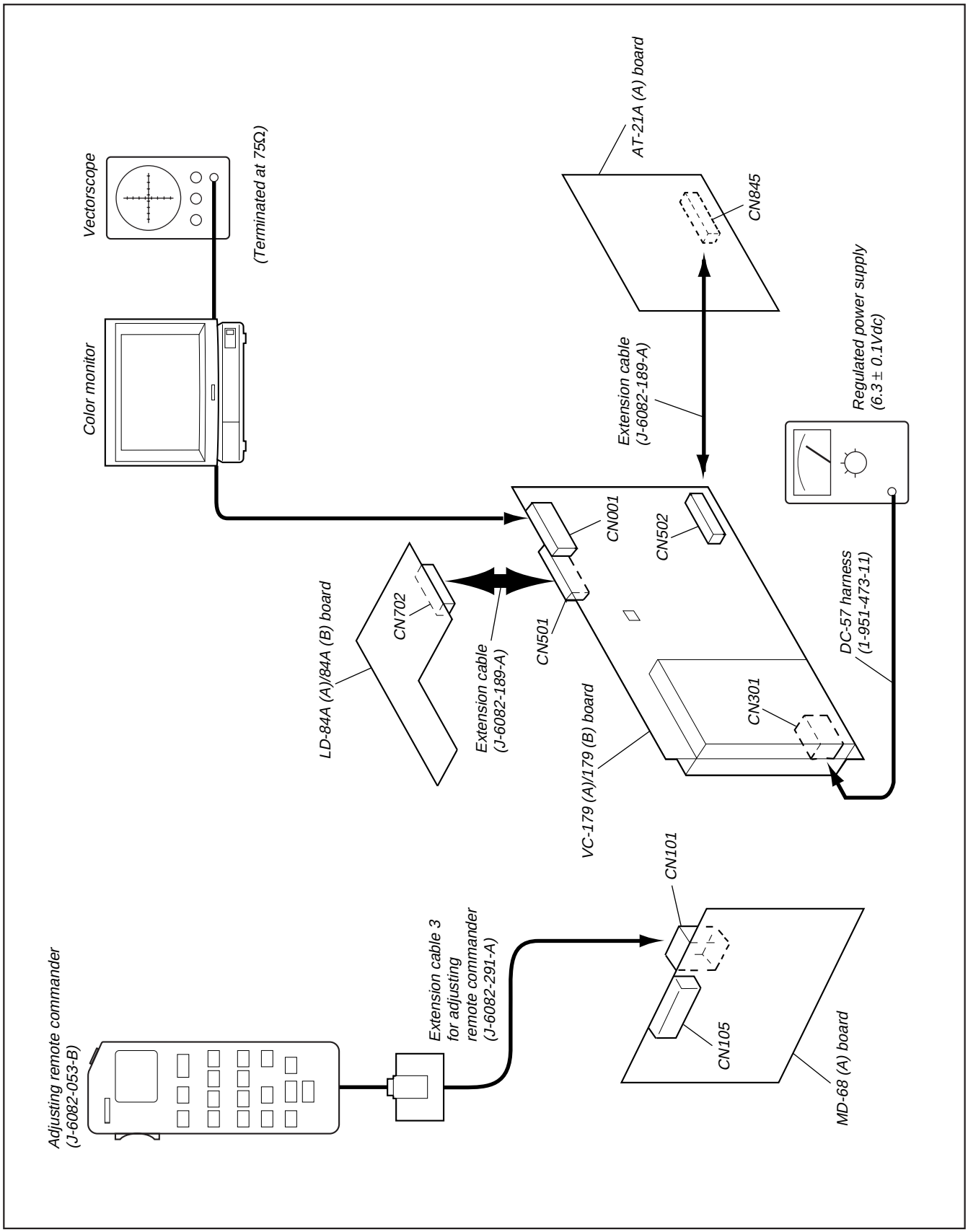

Vectorscope
(Terminated at 75Ω)
Color monitor
AT-21A (A) board
CN845
Extension cable
(J-6082-189-A)
Regulated power supply
(6.3 ± 0.1Vdc)
CN001
CN502
CN702
CN501
LD-84A (A)/84A (B) board
Extension cable
(J-6082-189-A)
DC-57 harness
(1-951-473-11)
CN301
VC-179 (A)/179 (B) board
CN101
Extension cable 3
for adjusting
remote commander
(J-6082-291-A)
CN105
MD-68 (A) board
Adjusting remote commander
(J-6082-053-B)

Fig. 6-3 (2).

6-1-3. Precautions

1. Adjusting Procedure

Adjust in the given order.

2. Subject

1) Color bar chart (Standard picture frame)
   Adjust the picture frame as shown in Fig. 6-4. if adjustments are performed using the color bar chart. (Standard picture frame)
2) White pattern (Standard picture frame)
   Remove the color bar chart from the pattern box, and so that the white pattern will be displayed.
   Don't touch the zoom switch.

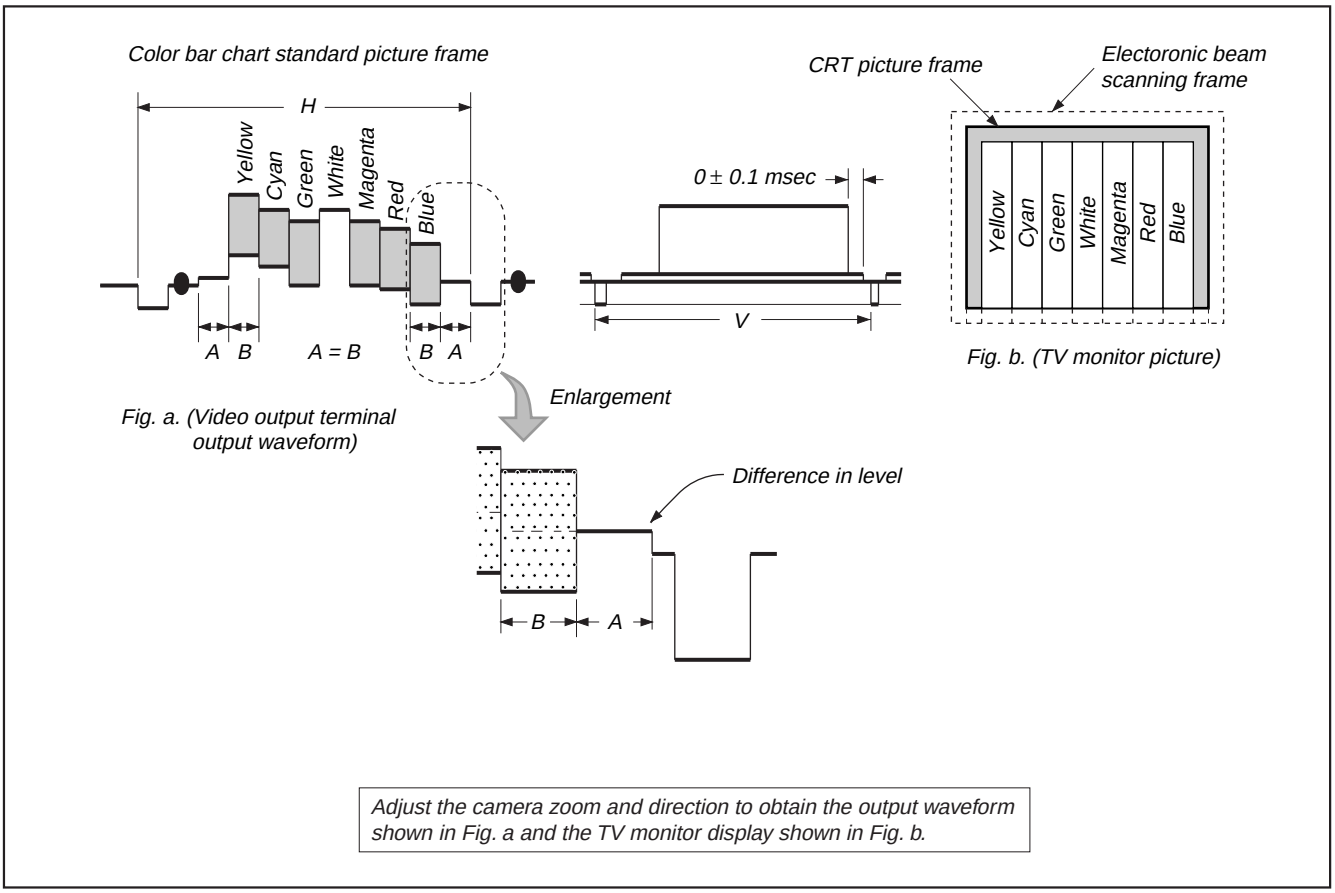


Fig. 6-4.

3) Chart for flange back adjustment
   Combine a white A0 size (1189 mm × 841 mm) paper to a black one, and make the chart shown in Fig. 6-5.

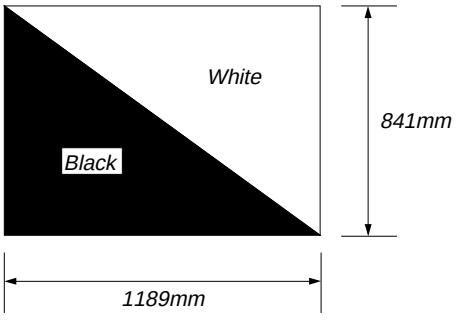


Fig. 6-5.

Note: Use the non-reflecting and non-glazing vellum paper whose size is more than A0, and make the boundary between white and black to be smoothly flat.

6-1-4. Adjusting Remote Commander

Use the adjusting remote commander to change the coefficient of the digital signal processing or the EVR data.
The adjusting remote commander uses the remote commander signal line (ECCP) to perform the bidirectional communication with the camera microprocessor. The effect data of the bidirectional communication must be written in the nonvolatile memory.

1. Using the adjusting remote commander

1) Connect the adjusting remote commander to the ECCP terminal (MD-68 (A) board CN101).
2) Adjust the HOLD switch of the adjusting remote commander to "HOLD" (SERVICE position).
   If it has been properly connected, the LCD on the adjusting remote commander will display as shown in Fig. 6-6.
3) Operate the adjusting remote commander as follows.
   • Changing the page
   The page increases when the EDIT SEARCH + button is pressed, and decreases when the EDIT SEARCH – button is pressed. There are altogether 16 pages, from 0 to F.

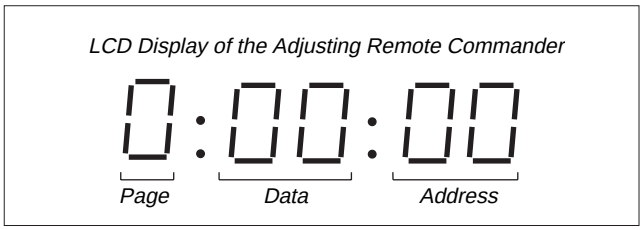
Hexadecimal notation	0 1 2 3 4 5 6 7 8 9 A B C D E F
LCD Display	0 1 2 3 4 5 6 7 8 9 A b c d E F
Decimal notation Conversion value	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Table. 6-1.

   • Changing the address
   The address increases when the FF (▶▶) button is pressed, and decreases when the REW (◀◀) button is pressed. There are altogether 256 addresses, from 00 to FF.
   • Changing the data (Data setting)
   The data increases when the PLAY (▶) button is pressed, and decreases when the STOP (■) button is pressed. There are altogether 256 data, from 00 to FF.
   • Writing the adjustment data
   The PAUSE button must be pressed to write the adjustment data (F page) in the nonvolatile memory.
   (The new adjustment data will not be recorded in the nonvolatile memory if this step is not performed.)
4) Select page: 6, address: 00, and adjust the data to 01.
   This releases the write protect of Page F, and enables the camera section (Addresses 01 to BF of page F) to be adjusted.
5) After completing all adjustments, turn off the main power supply once.

2. Precautions upon using the adjusting remote commander

Mishandling of the adjusting remote commander may erase the correct adjustment data at times. To prevent this, it is recommended that all adjustment data be noted down before beginning adjustments and new adjustment data after each adjustment.



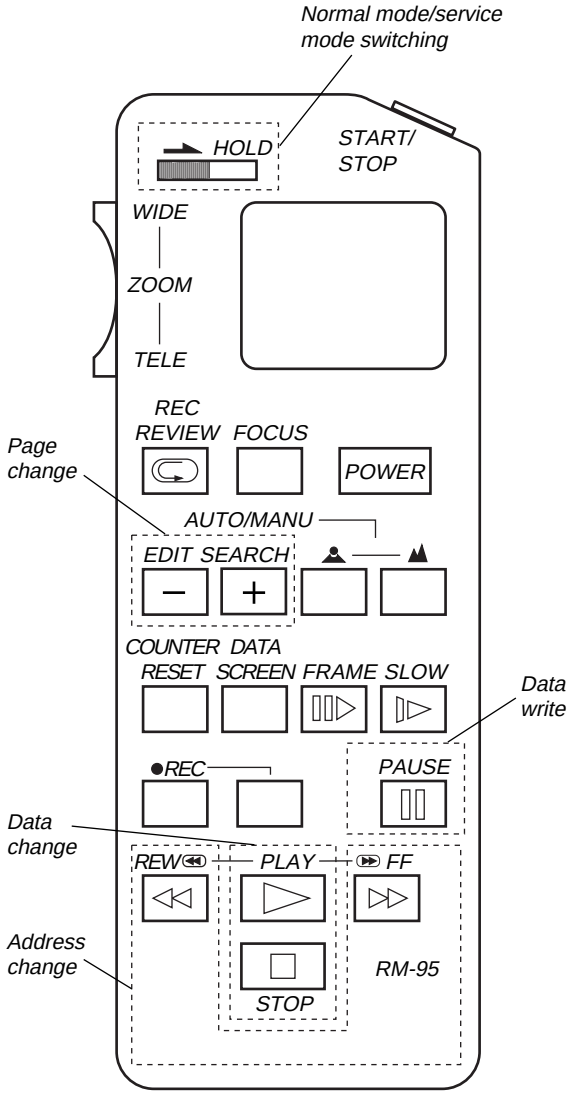


Fig. 6-6. Adjusting remote commander RM-95 (J-6082-053-B)

6-1-5. Page D Address List

Note 1: The adjustment data initial value is the data input before performing camera section adjustments (Page D) if the Page D data has been erased due to some reason.

Note 2: The data written in the adjustment data memo comumn are fixed.
After adjusting, check that these data have not been rewritten by mistake.

Note 3: In some case, data have been input to the page D address 71 to FF. This has no relation to the adjustment.

Note 4: No mark : PCS-C150 series
( ) : PCS-C150P series

Note 5: * PCS-C150 (NTSC): 04 (Only Camera Block 00)
PCS-C150P (PAL): 05 (Only Camera Block 01)

Caution: When adjusting the camera with only the camera block mounted, use the data for Only Camera Block.
After the adjustment, assemble the camera block to the pan tilt mechanism chassis, then input the above data and complete the procedure.
(Refer to 6-2-20. Page D Data Modification 2)

Address	Adjustment data	
	Initial value	Memo column
00	00	
01	00 (01)	*
02	00	90
03	00	03
04	00	00
05	00	00
06	00	00
07	72	72
08	60	60
09	00	00
0A	00	32
0B	00	00
0C	00	00
0D	00	00
0E	00	00
0F	00	00
10	00	00
11	30	30
12	00	00
13	2C	2C
14	00	00
15	08	08
16	06	06
17	00	00
18	00	00
19	00	00
1A	00	00
1B	00	00
1C	00	00
1D	00	00
1E	00	00
1F	30	30
20	00	00
21	2C	2C
22	00	00
23	08	08
24	06	06
25	00	00
26	00	00
27	00	00
28	00	00
29	00	00
2A	00	00
2B	00	00

Table. 6-2 (1).

Address	Adjustment data	
	Initial value	Memo column
2C	00	00
2D	30	30
2E	00	00
2F	2C	2C
30	00	00
31	08	08
32	06	06
33	00	00
34	00	00
35	00	00
36	00	00
37	00	00
38	00	00
39	00	00
3A	00	00
3B	30	30
3C	00	00
3D	2C	2C
3E	00	00
3F	08	08
40	06	06
41	00	00
42	00	00
43	00	00
44	00	00
45	00	00
46	00	00
47	00	00
48	00	00
49	30	30
4A	00	00
4B	2C	2C
4C	00	00
4D	08	08
4E	06	06
4F	00	00
50	06	06
51	00	00
52	00	00
53	00	00
54	00	00
55	00	00
56	00	00
57	30	30
58	00	00
59	2C	2C
5A	00	00

Table. 6-2 (2).

Address	Adjustment data	
	Initial value	Memo column
5B	08	08
5C	06	06
5D	00	00
5E	00	00
5F	00	00
60	00	00
61	00	00
62	18	18 (1C)
63	14	14 (18)
64	02	02
65	0F	0F
66	00	00
67	00	00
68	03	03
69	01	01
6A	00	00
6B	00	00
6C	00	00
6D	00	00
6E	FE	FE
6F	FE	FE
70	FE	FE
71 to FF		

Table. 6-2 (3).

6-1-6. Page F Address List

Note 1: The data already listed in the adjustment data memo column are fixed values.

Note 2: The adjustment data initial values are values just after executing “Page F Data Initialization” and “Page F Data Modification”. They are different from the values after executing all adjustments.

Note 3: In some cases, data have been input to the page F addresses C0 to EF. This has no relation to the adjustments.

Note 4: No mark : PCS-C150 series
( ) : PCS-C150P series

Address	Adjustment data	
	Initial value	Memo column
00	00	9C (9D)
01	00 (21)	00 (21)
02	00	00
03	40	40
04	80	
05	80	
06	80	
07	80	
08	2D	
09	26	
0A	FA	
0B	F1	
0C	30	
0D	00	
0E	58	
0F	00	
10	E0	E0
11	8F	
12	6C	
13	36	
14	3C	
15	60	
16	0D	
17	A3	
18	12	
19	8E	
1A	10	
1B	E2	
1C	0C	0C
1D	00	00
1E	80	
1F	80	
20	79	79
21	79	79
22	80	
23	77	77
24	5E (71)	77 (8A)
25	75	75
26	45	45
27	3F	3F
28	23	23
29	0B (0E)	0B (0E)

Table. 6-3 (1).

Address	Adjustment data	
	Initial value	Memo column
2A	28 (2C)	28 (2C)
2B	40	40
2C	FF	FF
2D	26 (42)	26 (42)
2E	16	16
2F	26	26
30	00	00
31	00	00
32	46 (4A)	46 (4A)
33	00	00
34	50	50
35	35	35
36	02	02
37	00	00
38	83	83
39	6A	6A
3A	50	50
3B	80	80
3C	20	20
3D	C0	C0
3E	00	
3F	00	
40	00	
41	00	
42	00	
43	00	
44	00	
45	00	
46	00	
47	00	
48	00	
49	00	
4A	00	
4B	00	
4C	00	
4D	00	
4E	00	
4F	20	20
50	02	02
51	02	02
52	66	66
53	18	18

Table. 6-3 (2).

Address	Adjustment data	
	Initial value	Memo column
54	6B	6B
55	9F	9F
56	66	66
57	6C	6C
58	5C	5C
59	83	83
5A	67	67
5B	5C	5C
5C	5C	5C
5D	4A	4A
5E	20	20
5F	5C	5C
60	3C	3C
61	33	33
62	0C	0C
63	26	26
64	24	24
65	A0	A0
66	04	04
67	05	05
68	00	00
69	00	00
6A	04 (00)	04 (00)
6B	00	00
6C	04 (00)	04 (00)
6D	00	00
6E	02	02
6F	33	33
70	B0	B0
71	18	18
72	0F	0F
73	0F	0F
74	00 (02)	00 (02)
75	43	47
76	1B	1B
77	E8 (D8)	E8 (D8)
78	A0	A0
79	30 (28)	30 (28)
7A	10 (0D)	10 (0D)
7B	50	50
7C	58	58
7D	88	88

Table. 6-3 (3).

Address	Adjustment data	
	Initial value	Memo column
7E	66	66
7F	46	46
80	8F	8F
81	00	00
82	20	20
83	18	18
84	02	02
85	08	08
86	40	40
87	20	20
88	40	40
89	30	30
8A	50	50
8B	60	60
8C	80	80
8D	23 (27)	23 (27)
8E	60 (6C)	60 (6C)
8F	00	00
90	00	00
91	77	77
92	00	00
93	FB	FB
94	04	04
95	32	32
96	6B	6B
97	8D	8D
98	A1	A1
99	30	30
9A	30	30
9B	21	21
9C	91	91
9D	72	72
9E	00	00
9F	00	00
A0	00	00
A1	00	00
A2	00	00
A3	00	00
A4	02	02
A5	80	80
A6	00	00
A7	80	80

Table. 6-3 (4).

Address	Adjustment data	
	Initial value	Memo column
A8	00	00
A9	80	80
AA	00	00
AB	80	80
AC	00	00
AD	00	00
AE	02	02
AF	44 (87)	44 (87)
B0	3D (39)	3D (39)
B1	25	25
B2	3D (39)	3D (39)
B3	25	25
B4	12 (32)	12 (32)
B5	4B (4A)	4B (4A)
B6	40	40
B7	68	68
B8	00	00
B9	80	80
BA	00	00
BB	00	00
BC	00	00
BD	00	00
BE	6B (6C)	6B (6C)
BF	2F (33)	2F (33)
C0 to EF		
F0		
F1		
F2		
F3		
F4		
F5		
F6		
F7		
F8		
F9		
FA		
FB		
FC		
FD		
FE		
FF		

Table. 6-3 (5).

6-1-7. Page 5 Address List

Note 1: The adjustment data initial value is the data input before performing camera section adjustments (Page 5) if the Page 5 data has been erased due to some reason.

Note 2: The data written in the adjustment data memo column are fixed.
After adjusting, check that these data have not been rewritten by mistake.

Note 3: In some case, data have been input to the page 5 address A0 to FF. This has no relation to the adjustment.

Note 4: No mark : PCS-C150 series
( ) : PCS-C150P series

Address	Adjustment data	
	Initial value	Memo column
00		
01	00 (01)	00 (01)
02	04 (03)	04 (03)
03	2A	2A
04	03	03
05	1B (1C)	1B (1C)
06	6C (7C)	6C (7C)
07	14 (18)	14 (18)
08	7C (8C)	7C (8C)
09	14 (18)	14 (18)
0A	20 (24)	20 (24)
0B	0C (0E)	0C (0E)
0C	00	00
0D	00	00
0E	0A	0A
0F	1D	1D
10	00	00
11	01	01
12	02	02
13	10	10
14	11	11
15	12	12
16	13	13
17	14	14
18	10	10
19	12 (10)	12 (10)
1A	10	10
1B	10 (0C)	10 (0C)
1C	16	16

Table. 6-4 (1).

Address	Adjustment data	
	Initial value	Memo column
1D	96	96
1E	A0	A0
1F	8C	8C
20	6E	6E
21	82	82
22	10	10
23	12 (10)	12 (10)
24	10	10
25	10 (0C)	10 (0C)
26	16	16
27	B4	B4
28	8C	8C
29	64	64
2A	82	82
2B	FF	FF
2C	01	01
2D	09	09
2E	04	04
2F	16	16
30	19	19
31	0F	0F
32	14	14
33	02	02
34	01	01
35	07	07
36	02	02
37		
38	3C	3C
39	78	78
3A	02	02
3B	3C	3C
3C	64	64
3D	00	00
3E	00	00
3F	00	00
40	02	02
41	00	00
42	0F	0F
43	10	10
44	18	18
45	00	00
46	03	03
47	02	02
48	7F	7F

Table. 6-4 (2).

Address	Adjustment data	
	Initial value	Memo column
49	FF	FF
4A	7F	7F
4B	FF	FF
4C	7F	7F
4D	FF	FF
4E	7F	7F
4F	FF	FF
50	03	
51	5E	
52	01	
53	1A	
54	06	
55	BC	
56	02	
57	34	
58	02	
59	03	
5A	0B	0B
5B	0B	0B
5C	44	44
5D	74	74
5E	48	40
5F	04	04
60	09	09
61	06	06
62	12	12
63	12	12
64	04	04
65	04	04
66	05	05
67	05	05
68	07 (08)	07 (08)
69	07 (08)	07 (08)
6A	0C (0A)	0C (0A)
6B	0C (0A)	0C (0A)
6C	00	00
6D	0E	0E
6E	00	00
6F	16	16
70	00	00
71	50	50
72	00	00
73	60	60
74	0C	0C

Table. 6-4 (3).

Address	Adjustment data	
	Initial value	Memo column
75	06	06
76	06	06
77	03	03
78	14 (17)	14 (17)
79	14	14
7A	05 (04)	05 (04)
7B	30	30
7C	30	30
7D	81	81
7E	18 (1C)	18 (1C)
7F	14 (18)	14 (18)
80	02	02
81	02	02
82	02	02
83	02	02
84	02	02
85	0A	0A
86	0F	0F
87	96	96
88	20	20
89		
8A		
8B		
8C	00	00
8D		
8E		
8F		
90	28	28
91	6C	6C
92	02	02
93	06	06
94	46	46
95	40	40
96	50	50
97	0B	0B
98	04	04
99	64	64
9A	30	30
9B	0A	0A
9C	06	06
9D	04	04
9E	0C	0C
9F	00	00
A0 to FF		

Table. 6-4 (4).

6-1-8. Data Processing

The calculation of the adjusting remote commander display data (hexadecimal notation) is required for obtaining the adjustment data of some adjustment itemes. In this case, after converting the hexadecimal notation to decimal notation, calculate and convert the result to hexadecimal notation, and use it as the adjustment data. Table. 6-5. indicates the hexadecimal notation-the decimal notation calculation table.

Hexagecimal notation-Decimal notation

The lower digits of the hexadecimal notation / The upper digits of the hexadecimal notation	0	1	2	3	4	5	6	7	8	9	A (A)	B (b)	C (c)	D (d) ②	E (E)	F (F)
0	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
2	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
3	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
4	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
5	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95
6	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111
7	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
8	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
9	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
A (A)	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
①→ B (b)	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191
C (c)	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
D (d)	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
E (E)	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
F (F)	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255

Note: ( ) indicate the adjusting remote commander display.

(Example) In the case that the adjusting remote commander display is BD (bd).

As the upper digit of the hexadecimal notation is B (b), and the lower digit is D (d), the intersection "189" of the ① and ② in the above table is the decimal notation to be calculated.

Table. 6-5.

6-2. CAMERA SYSTEM ADJUSTMENT

6-2-1. Power Supply Voltage Check (VC-179 (A)/179 (B) board)

Subject	Option
Measuring instrument	Digital voltmeter
MT5V check	
Measurement point	Pins ⑥ and ⑧ of CN501
Specified value	4.9 ± 0.1 Vdc
D3.5V check	
Measurement point	Pin ⑬ and ⑭ of CN504
Specified value	3.55 ± 0.1 Vdc
CAM4.9V check	
Measurement point	Pin ⑰ and ⑱ of CN504
Specified value	4.9 ± 0.1 Vdc
CAM15V check	
Measurement point	Pin ① of CN401
Specified value	15.2 ± 0.3 Vdc
CAM – 8.5V check	
Measurement point	Pin ③ of CN401
Specified value	$-8.5\ ^{+0.25}_{-0.4}$ Vdc

Checking method:

1) Check that each power supply voltage satisfies the specified value.

6-2-2. Page D Data Initialization

Initializing method:

1) Page: 1, address: 00, data: 01.
2) Check that the data of page: 1, address: 03 is 00.
3) • PCS-C150 (NTSC)
   Set data: 01 to page: 1, address: 02, and press the PAUSE button of the adjusting remote commander.
   • PCS-C150P (PAL)
   Set data: 02 to page: 1, address: 02, and press the PAUSE button of the adjusting remote commander.
4) Check that the data of page: 1, address: 03 is 01.
5) Set data: 00 to page: 1, address: 02, and press the PAUSE button of the adjusting remote commander.
6) After performing "Page D data modification", perform all the adjustments of the camera section (page D).

6-2-3. Page D Data Modification 1

The data (initial data) that is automatically written on page D after the initialization of the page D data will differ according to some camera micro processor versions. Change the data by manual input, arrange it.

Note 1: When changing the data, to write the data to the non-volatile memory, press the PAUSE button of the adjusting remote commander every time the new data is set.

PCS-C150

Address	Data
01	*
02	90
03	03

PCS-C150P

Address	Data
01	*
02	90
03	03

Note 2: * PCS-C150: 00
PCS-C150P: 01
After the camera adjustment, input the data given below.
PCS-C150: 04
PCS-C150P: 05
(Refer to 6-2-20. Page D Data Modification 2.)

6-2-4. Page F Data Initialization

Note: It is necessary to perform all adjustments of the camera section from the beginning again if the data of page F has been initialized.

Initializing method:

1) Page: 6, address: 00, data: 01.
2) Check that the data of page: 6, address: 11 is 00.
3) • PCS-C150 (NTSC)
   Set data: 2D to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
   • PCS-C150P (PAL)
   Set data: 2F to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
4) Check that the data of page: 6, address: 11 is 01.
5) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
6) After performing "Page F data modification", perform all the adjustments of the camera section (page F).

6-2-5. Page F Data Modification

The data (initial data) that is automatically written on page F after the initialization of the page F data will differ according to some camera micro processor versions. Change the data by manual input, and
arrange it.

Note 1: When changing the data, to write the data to the non-volatile memory, press the PAUSE button of the adjusting remote commander every time the new data is set.

Note 2: When changing address: 00, set the data of page: 6, address: 00 to 80.

PCS-C150

Address	Data
24	77
70	47

PCS-C150P

Address	Data
24	8A
70	47

[Distinguishing the Camera Micro Processor (VC-179 (A)/179 (B) Board IC502) Versions]

Each version can be distinguished by looking at the part name of the camera micro processor or the data of page: 6, address: 10.

Version	Part Name	Page: 6 Address: 10
Ver. 2.0	SC424624	20

6-2-6. 28 MHz Original Oscillation Adjustment (VC-179 (A)/179 (B) board)

Adjust the 28 MHz oscillation of the synchronization clock.
If the oscillation is not 28 MHz, the period will be inaccurate or the image will not be in color.

Subject	Not required
Measurement Point	CL401 (IC402 ⑫ pin)
Measuring Instrument	Frequency counter
Adjustment Page	F
Adjustment Address	22
Specified Value	14318181 ± 71Hz (NTSC)
	14187500 ± 70Hz (PAL)

Adjusting method:

1) Set data: 01 to page: 6, address: 00.
2) Change the data of page: F, address: 22 to adjust the oscillation frequency to 14318181 ± 71Hz (14187500 ± 70Hz).

6-2-7. V SUB Adjustment

Set the CCD imager V SUB voltage to the voltage specified for the imager.

Subject	Not required
Adjustment Page	F
Adjustment Address	04

Adjusting method:

1) Read the V SUB voltage code of the CCD imager.
   Obtain the corresponding V SUB data from the following table.
2) Set data: 01 to page: 6, address: 00.
3) Set the V SUB data to page: F, address: 04.
4) Press the PAUSE button of the adjusting remote commander.

V SUB			V SUB		
Voltage Code	Data	Voltage (Vdc)*1	Voltage Code	Data	Voltage (Vdc)*1
e	70	9.0	q	AC	14.0
f	77	9.5	r	B2	14.5
g	7C	10.0	s	B8	15.0
h	82	10.5	t	BE	15.5
j	88	11.0	u	C4	16.0
k	8E	11.5	v	CA	16.5
l	94	12.0	w	D0	17.0
m	9A	12.5	x	D6	17.5
n	A0	13.0	y	DD	18.0
p	A6	13.5	z	E2	18.5

6-2-8. VRG Adjustment

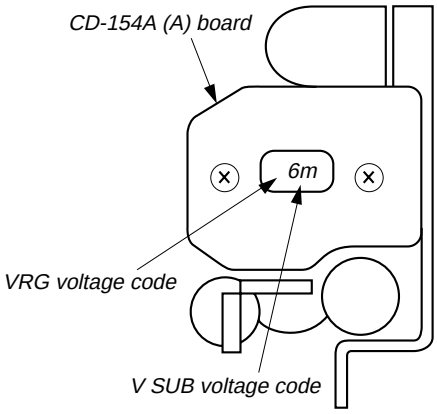
Set the CCD imager V RG voltage to the voltage specified for the imager.

Subject	Not required
Adjustment Page	F
Adjustment Address	05

Adjusting method:

1) Read the VRG voltage code of the CCD imager.
   Obtain the corresponding VRG data from the following table.
2) Set data: 01 to page: 6, address: 00.
3) Set the VRG data to page: F, address: 05.
4) Press the PAUSE button of the adjusting remote commander.

VRG		
Voltage Code	Data	Voltage (Vdc)*2
1	34	1.0
2	4E	1.5
3	69	2.0
4	83	2.5
5	9E	3.0
6	B8	3.5
7	D3	4.0



(Example) When “6m” is displayed:
The V SUB voltage code is “m” and therefore the V SUB data will be “9B”.
The VRG voltage code is “6” and therefore the VRG data will be “B8”.

Fig. 6-7.

6-2-9. Flange Back Adjustment

The flange back adjustment for the inner focus lens is performed automatically.

Subject	Chart for flange back adjustment (2000 ± 5mm from the front side of the lens Luminance: 300 ± 50 lux)
Measurement Point	Check the operation on the TV monitor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	16, 17, 18, 19, 1A, 1B

Adjusting method:

1) Check that the flange back adjustment chart center and the exposure display center coincide at both zoom lens TELE end and WIDE end.
2) Set data: 01 to page: 6, address: 00.
3) Check that the data of page: 6, address: 21 is 00.
4) Check that the page: F, address: 16 to 1B data is at the initial value. (Refer to Table. 6-3. “Page F address list”.)
5) Set data: 13 to page: 6, address: 01 and press the PAUSE button of the adjusting remote commander.
6) Set data: 15 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
   (The adjustment data is automatically input to page: F, addresses: 16 to 1B.)
7) Check that the data of page: 6, address: 21 is 01.
   (Display indicating flange back adjustment completion)

Processing after completing adjustments

1) Turn off the main power supply.

6-2-10. Flange Back Check

Subject	Siemens star (2m from the front of the lens)
Measurement Point	TV monitor
Measuring Instrument	
Specified Value	Focused at the TELE end and WIDE end.

Checking method:

1) Place the Siemens star 2m from the front of the lens.
2) To open the IRIS, decrease the luminous intensity to the Siemens star up to a point before noise appears on the image.
3) Shoot the siemens star with the zoom TELE end.
4) Turn ON the auto focus.
5) When the lens is focused, turn OFF the auto focus.
6) Shoot the siemens star with the zoom WIDE end.
7) Check that the lens is focused.

Note 1: When the auto focus is ON, the lens can be checked if it is focused or not by observing the data on page A of the adjusting remote commander.

1) Set data: 0C to page: 6, address: 02.
2) Page A shows the state of the focus.
   A: 00: XX
   (Odd: Focused
   Even: Unfocused)

Processing after compleating adjustments

1) Set data: 00 to page: 6, address: 02.

6-2-11. Hall Adjustment

To eliminate the differences in the outputs of the hall element attached to the iris for detecting the position of the lens iris, adjust the hall AMP gain and hall offset.

Subject	Not required
Measurement Point	Lower 2 digits of the date of the page A displayed
Measuring Instrument	
Adjustment Page	F
Adjustment Address	06, 07
Specified Value	33 to 37 during IRIS OPEN B4 to B8 during IRIS CLOSE

Adjusting method:

1) Set data: 01 to page: 6, address: 00.
2) Set data: 03 to page: 6, address: 02.
3) Set data: 03 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
4) Set data: 80 to page: F, address: 07, and press the PAUSE button of the adjusting remote commander.
5) Set data: 40 to page: F, address: 06, and press the PAUSE button of the adjusting remote commander.
6) Read the page A display data, and this data is named W2.
7) Set data: 30 to page: F, address: 06, and press the PAUSE button of the adjusting remote commander.
8) Read the page A display data, and this data is named W1.
9) Set data: 01 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
10) Read the page A display data, and this data is named K1.
11) Set data: 40 to page: F, address: 06, and press the PAUSE button.
12) Read the page A display data, and this data is named K2.
13) Convert W1, W2, K1, K2 to decimal notation, and obtain W1', W2', K1', K2'. (Refer to Table. 6-5. "Hexadecimal notation-decimal notation conversion table".)
14) Calculate X1' using the following equations (decimal notation calculation).

$$A' = W2' + K1' - W1' - K2' \quad \text{..... Equation 1}$$

$$B' = W1' - K1' \quad \text{..... Equation 2}$$

$$X1' = \frac{2064 + (48 \times A') - (16 \times B')}{A'} \quad \text{..... Equation 3}$$

15) Convert X1' to hexadecimal notation, and obtain X1. (Round off to one decimal place)
16) Set data: X1 to page: F, address: 06, and press the PAUSE button of the adjusting remote commander.
17) Change the data of page: F, address: 07, and adjust the page A display data to "35".
18) Press the PAUSE button of the adjusting remote commander.
19) Set data: 03 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
20) Read the page A display data, and this data is named W0. If W0 lies within the "B4" to "B8" range, perform "Processing after completing adjustments". If it lies outside the range, perform the following adjustments.
21) Convert W0 to hexadecimal notation, and obtain W0'.
22) Calculate X2' using the following equations (decimal notation calculation).

$$C' = W0' - B' - 52 \quad \text{..... Equation 4}$$

$$X2' = \frac{(129 - B') \times (X1' - 48) + 48 \times C}{C'} \quad \text{..... Equation 5}$$

(X1' and B' are values obtained from equations 2 and 3)

23) Convert X2' to hexadecimal notation and obtain X2. (Round off to one decimal place)
24) Set data X2 to page: F, address: 06, and press the PAUSE button of the adjusting remote commander.
25) Change the data of page: F, address: 07, and adjust tha page A display data to "B6".
26) Press the PAUSE button of the adjusting remote commander.
27) Set data: 01 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
28) Check that the page A display data lies within the "33" to "37" range.

Processing after Completing Adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.

6-2-12. Picture Frame Setting

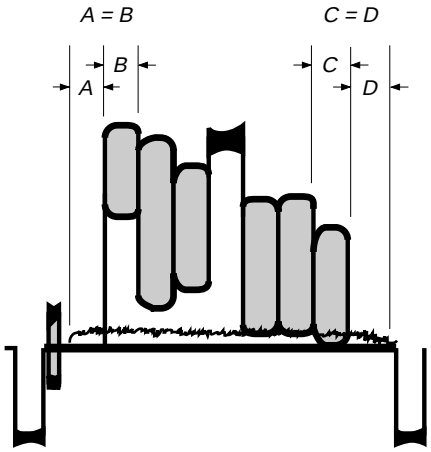
Subject	Color bar chart standard picture frame
Measurement Point	VIDEO OUT terminal
Measuring Instrument	Oscilloscope and TV monitor
Specified Value	A=B, C=D, t=0 $^{+0.1}_{-0}$ msec

Setting method:

1) Turn the auto focus off.
2) Adjust the focus.
3) Adjust the zoom and the camera direction, and set to the specified position.
4) Mark the position of the picture frame on the monitor display, and adjust the picture frame to this position in following adjustments using “color bar chart standard picture frame”.

Check on the oscilloscope

1. Horizontal period



2. Vertical period

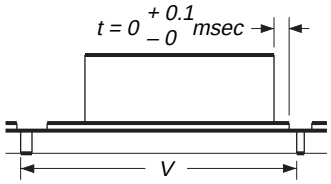


Fig. 6-8.

Check on the TV monitor

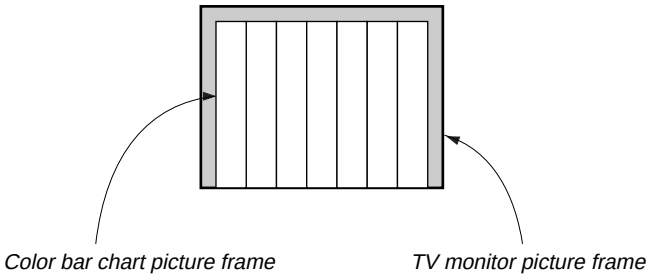


Fig. 6-9.

6-2-13. Color Reproduction Adjustment

Adjust the color separation matrix coefficient so that the proper color reproduction is produced.

Subject	Color bar chart standard picture frame
Measurement Point	VIDEO OUT terminal
Measuring Instrument	Vectorscope
Adjustment Page	F
Adjustment Address	08, 09, 0A, 0B
Specified Value	All color luminance points should settle within each color reproduction frame.

Adjusting method:

1) Set data: 01 to page: 6, address: 00.
2) Set data: 00 to page: 6, address: 03.
3) Set data: F1 to page: F, address: 10, and press the PAUSE button of the adjusting remote commander.
4) Adjust the GAIN and PHASE of the vectorscope, and adjust the burst luminance point to the burst position of the color reproduction frame.
5) Change the data of addresses 08, 09, 0A and 0B of page: F, and settle each color luminance point in each color reproduction frame.

Note 1: Be sure to press the PAUSE button of the adjusting remote commander before changing the addresses.
If not, the new data will not be written to the memory.

6) Press the PAUSE button of the adjusting remote commander.

Processing after completing adjustments

1) Set data: E0 to page: F, address: 10, and press the PAUSE button of the adjusting remote commander.
2) Set data: 26 to page: F, address: 63, and press the PAUSE button of the adjusting remote commander.
3) Set data: 10 to page: 6, address: 03.

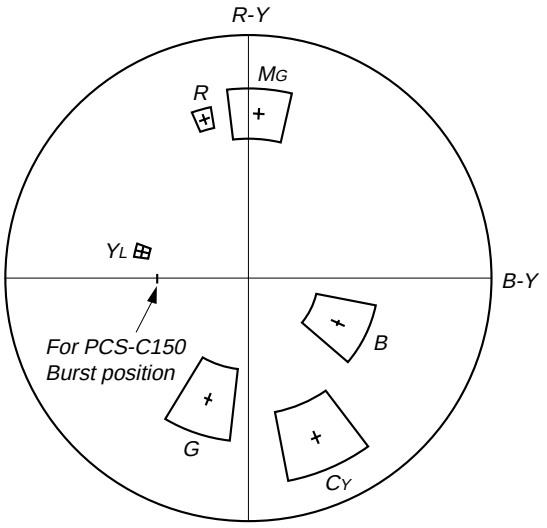


Fig. 6-10.

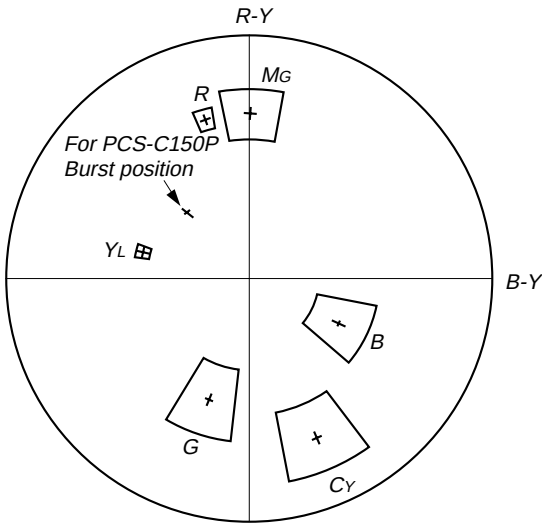


Fig. 6-11.

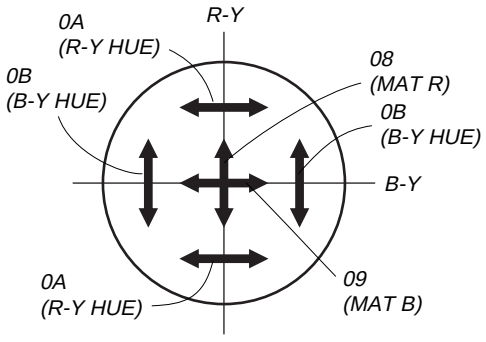


Fig. 6-12. Direction of the Movements of the Adjustment Address and Luminance Point.

6-2-14. Iris IN/OUT Adjustment (VC-179 (A)/179 (B) board)

For the unit to judge if the white balance is indoors or outdoors in auto white balance operations, measure the light level and write it in the EEPROM.
If the level is not correct, the white balance will not be accurate.

Subject	White pattern
Measurement Point	Lower 2 digits of the date of the page
Measuring Instrument	A displayed
Adjustment Page	F
Adjustment Address	13, 14

Adjusting method:

1) Set data: 01 to page: 6, address: 00.
2) Set data: 0E to page: 6, address: 02.
3) Set data: 0B to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
4) Read the page A display data (Note 1), and take the upper two digits as D1 and the lower two as D2.
5) Convert D1 to a decimal number and obtain D1'. (Refer to Table. 6-5. "Hexadecimal Notation-Decimal Notation Conversion Table".)
6) Calculate D3' using the following equations. (Equations 1 and 2 are for decimal notation calculation)
   When D2 ≧ D0
   D3'= D1' – 21 ..... Equation 1
   When D2 < D0
   D3'= D1' – 22 ..... Equation 2
7) Convert D3' to a hexadecimal number and obtain D3.
8) Set D3 to page: F, address: 13, and press the PAUSE button of the adjusting remote commander.
9) Set data: 09 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
   (IND0.5 SHUTTER mode setting)
10) Read the page A display data (Note 1), and take the upper two digits as D4 and the lower two as D5.
11) Convert D4 to decimal number and obtain D4'. (Refer to Table. 6-5. "Hexadecimal Notation-Decimal Notation Conversion Table".)
12) Calculate D6' using the following equations. (Equations 3 and 4 are for decimal notation calculation)
   When D5 ≧ F0
   D6'= D4'– 13 ..... Equation 3
   When D5 < F0
   D6'= D4'– 14 ..... Equation 4
13) Convert D6' to a hexadecimal number and obtain D6.
14) Set D6 to page: F, address: 14, and press the PAUSE button of the adjusting remote commander.

Note 1: The right four digits of the display data at the right bottom side of the monitor TV is the LIGHT LEVEL data. If the lower digits change severely and cannot be read, record it on a tape once, play it back by frame feeding, and obtain the average value.

Processing after Completing Adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
2) Set data: 00 to page: 6, address: 02.

6-2-15. Max Gain Adjustment (VC-179 (A)/179 (B) board)

Correct the differences in the minimum illuminance.
If the illuminance is not consistent, the image level required for taking subjects in low illuminance will not be produced (dark).

Subject	White pattern standard picture frame
Measurement Point	VIDEO OUT terminal
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	15
Specified Value	PCS-C150 A=450mV PCS-C150P A=460mV

Adjusting method:

1) Set data: 01 to page: 6, address: 00.
2) Set data: 04 to page: F, address: 2D.
3) Set data: 19 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
4) Change the data of page: F, address: 15, and adjust so that the signal level (A) becomes the specified value.
   Note: The data of address: 15 should be 70 to FF.
5) Press the PAUSE button of the adjusting remote commander.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
2) Return the data page: F, address: 2D to an initialized value.

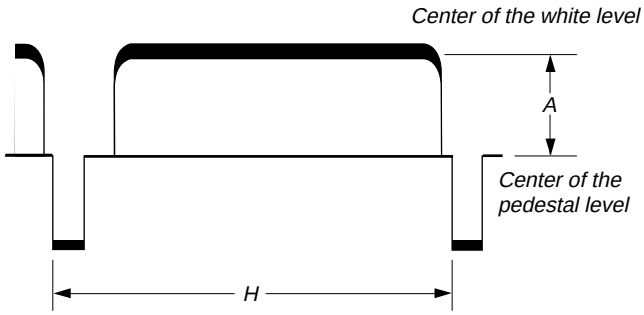


Fig. 6-13.

6-2-16. Auto White Balance Standard Data Input

Subject	White pattern standard picture frame
Adjustment Page	F
Adjustment Address	0C, 0D, 0E, 0F

Adjusting method:

1) Turn the power of the unit OFF/ON.
2) Set data: 01 to page: 6, address: 00.
3) Check that the data of page: 6, address: 11 is 00.
4) Wait for 2 seconds.
5) Set data: 11 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
6) Set data: 0D to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
   (When the standard data is taken in, the data will be automatically input to addresses 0C to 0F of page F.)
7) Check that the data of page: 6, address: 11 is 01.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.

6-2-17. Auto White Balance Adjustment

Adjust to the proper auto white balance output data.
If it is not correct, auto white balance and color reproducibility will be poor.

Subject	White pattern standard picture frame
Filter	Filter C14 for color temperature correction
Measurement Point	Check with the 2 digits of page A displayed
Measuring Instrument	
Adjustment Page	F
Adjustment Address	11, 12
Specified Value	R ratio: 2B40 to 2BC0 B ratio: 5E00 to 5F00

Adjusting method:

1) Place the C14 filter for color temperature correction on the lens.
2) Set data: 01 to page: 6, address: 00.
3) Set data: D0 to page: F, address: 10, and press the PAUSE button of the adjusting remote commander.
4) Set data: 04 to page: 6, address: 02.
5) Change the data of page: F, address: 11, and adjust the average value of the page A display data to the R ratio specified value.
6) Press the PAUSE button of the adjusting remote commander.
7) Set data: 05 to page: 6, address: 02.
8) Change the data of page: F, address: 12, and adjust the average value of the page A display data to the B ratio specified value.
9) Press the PAUSE button of the adjusting remote commander.

Processing after completing adjustments

1) Set data: E0 to page: F, address: 10, and press the PAUSE button of the adjusting remote commander.
2) Set data: 00 to page: 6, address: 02.

6-2-18. White Balance Check

Subject	White pattern standard picture frame
Filter	Filter C14 for color temperature correction ND filter 1.0 and 0.3
Measurement Point	VIDEO OUT terminal
Measuring Instrument	Vectorscope
Specified Value	6-14 A to C

Checking method:

1) Check that the lens is not covered with either filter.
2) Set data: 01 to page: 6, address: 00.
3) Set data: 0F to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
4) Check that the center of the white luminance point is within the circle shown in Fig. 6-14. A.
5) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
6) Set data: 23 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
7) Place the C14 filter on the lens.
8) Check that the center of the white luminance point settles in the circle shown in Fig. 6-14. B.
9) Remove the C14 filter, and place the ND filter 1.3 (1.0 + 0.3) on the lens.
10) Check that the center of the white luminance point settles in the circle shown in Fig. 6-14. C.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote commander.
2) Set data: 00 to page: 6, address: 00, and press the PAUSE button.

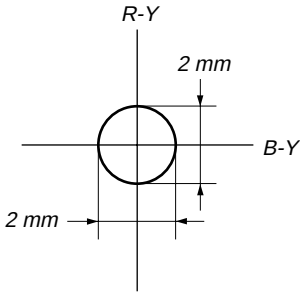


Fig. 6-14. A

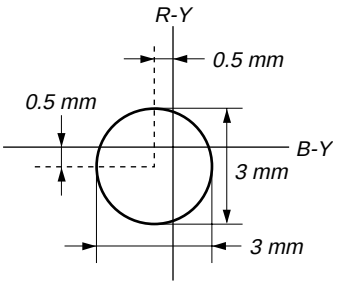


Fig. 6-14. B

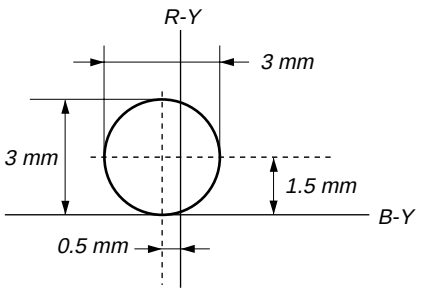


Fig. 6-14. C

6-2-19. VIDEO OUT Level Check

Subject	Color bar chart standard picture frame	
Measurement Point	VIDEO OUT terminal (Terminated at 75Ω)	
Measuring Instrument	Oscilloscope	
Specified Value	Y level	= 650 ± 60mV (NTSC) = 630 ± 60mV (PAL)
	SYNC level	= 286 ± 40mV (NTSC) = 300 ± 40mV (PAL)
	BURST level	= 286 ± 40mV (NTSC) = 300 ± 40mV (PAL)

Checking method:

1) Check that the Y level, SYNC level and BURST level satisfy the specified values.

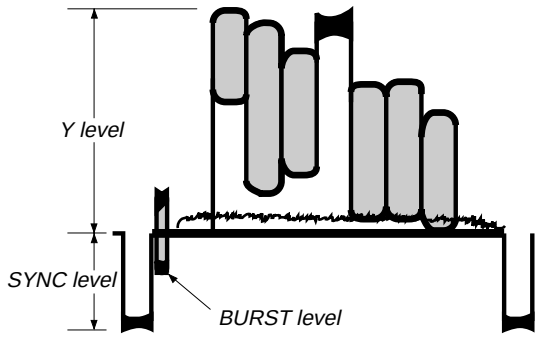


Fig. 6-15.

6-2-20. Page D Data Modification 2

After the camera adjustment, change the data of page D and address 01 to the following:

PCS-C150 (NTSC) Data: 04
PCS-C150P (PAL) Data: 05

6-2-21. Page 5 Data Initialization

Initializing method:

1) Page: B, address: 00, data: 01.
2) Check that the data of page: B, address: 02 is 00.
3) • PCS-C150 (NTSC)
   Set data: 80 to page: B, address: 01 and press the PAUSE button of the adjusting remote commander.
   • PCS-C150P (PAL)
   Set data: 81 to page: B, address: 01 and press the PAUSE button of the adjusting remote commander.
4) Check that the data of page: B, address: 02 is 01.
5) Turn off the main power supply once.

6-2-22. Home Position Adjustment

Home position adjustment for Pan-Tilter is performed automatically.

Adjustment Page	5
Adjustment Address	50, 51, 52, 53, 54, 55, 56, 57, 58, 59

Adjusting method:

1) Set data: 01 to page: B, address: 00.
2) Check that the data of page: B, address: 02 is 00.
3) Set data: 10 to page: B, address: 01 and press the PAUSE button of the adjusting remote commander.
4) Check that the data of page: B, address: 02 is 01.
5) Set data: 40 to page: 5, address: 5E and press the PAUSE button of the adjusting remote commander.
6) Turn off the main power supply once.

Note: When the camera block has been removed from the pan tilt mechanism chassis, be sure to perform Home Position Adjustment.

6-3. ELECTRICAL BLOCK CHECK

6-3-1. Pan Tilter Operation Check

Checking method:

1) Use VISCA to send the commands to move the pan tilter horizontally and vertically.
2) Drive the pan tilter to the top and bottom end points and to left and right end points.
3) Check that the tilter operates normally.

SECTION 7
VISCA COMMAND LIST

7-1. VISCA Summary

PCS-C150/C150P uses a protocol called VISCA. In VISCA, the computer or other device issuing the commands is called the controller and the PCS-C150/C150P or other device receiving those commands is called the peripheral device. Under VISCA, up to 7 VISCA Equipments can be connected to one controller using RS-232C communications. The RS-232C parameters are communications speed of 9600 baud, data length of 8 bits, 1 stop bit, 1 start bit, and no parity. Flow control, such as XON/XOFF and RTS/CTS, is not used. The VISCA Equipments are connected in a daisy chain. The actual internal connections form a one-way ring, as shown in the figure below, so messages pass through all the devices and return to the controller. Each device has an address on this network. The address of the controller is always 0. The addresses of the devices are numbered 1, 2, 3, etc., in order from closer to the controller to farther away. As part of the initialization operations, the controller sends the address command to set the addresses for the VISCA Equipments.

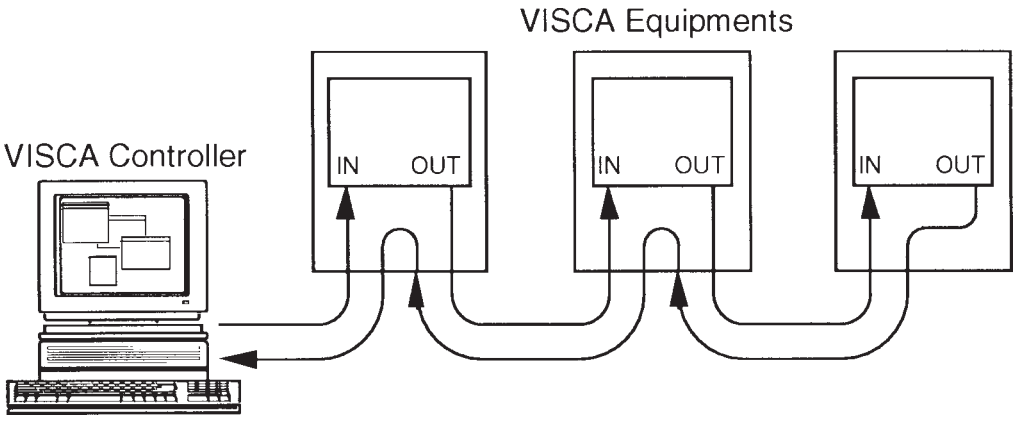
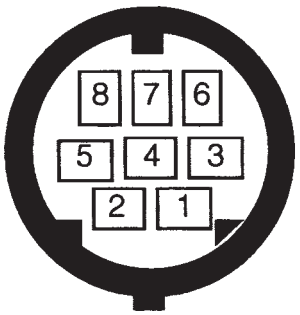


Fig. 7-1. VISCA Network

PCS-C150/C150P has a VISCA IN port and a VISCA OUT port. As viewed from the outside, both the VISCA IN and VISCA OUT ports have the connector pin layout shown in Fig. 7-2. During control by a computer, set the PCS-C150/C150P DTR input (the computer's S output) high.



1. DTR	Data Transmission Ready (OUTPUT)
2. $\overline{\text{DSR}}$	Data Set Ready (INPUT)
3. TXD	Transmit Data (OUTPUT)
4. GND	Ground
5. $\overline{\text{RXD}}$	Receive Data (INPUT)
6. GND	Ground
7. OPEN	Not Used
8. OPEN	Not Used

Fig. 7-2. VISCA Connector

7-2. PCS-C150/C150P VISCA Connection

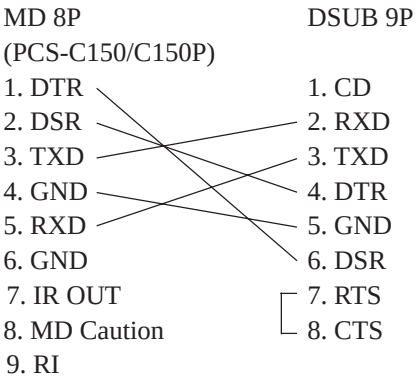


Fig. 7-3. VISCA Connection (Windows)

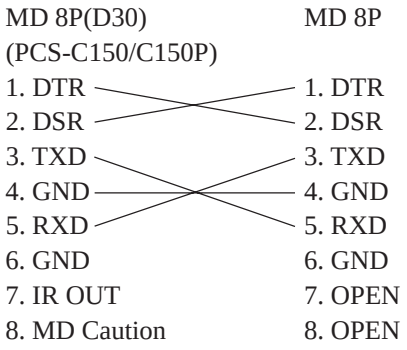


Fig. 7-4. VISCA Connection (Mac)

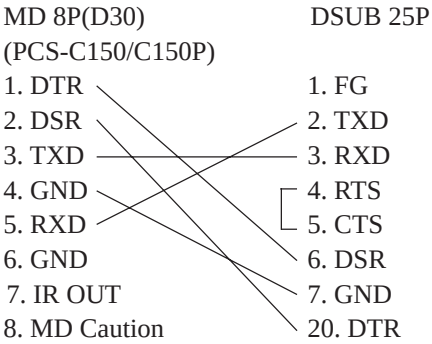


Fig. 7-5. VISCA Connection (PC98)

7-3. VISCA Communication Formats

7-3-1. VISCA Packet Structure

The basic unit for VISCA communications is the packet (shown in Fig. 7-6.). The first byte 1 in the packet is the header. It contains the sender and destination addresses. For example, the header for a packet sent from the computer at address 0 to PCS-C150/C150P at Address 1 is 81H (hexadecimal).
A packet sent to PCS-C150/C150P at Address 2 has a header of 82H. In the tables after pages 7-6, the header is listed as 8X. Insert the PCS-C150/C150P address in place of the X. The header for a packet sent in response from the PCS-C150/C150P at Address 1 is 90H. For a response packet form the PCS-C150/C150P at Address 2, the header is A0H.
Some of the setting commands (refer to Page 7-4) can be sent to all the equipment at one time (broadcast). For a broadcast, the header is 88H.
The terminator, FFH, ends the packet.

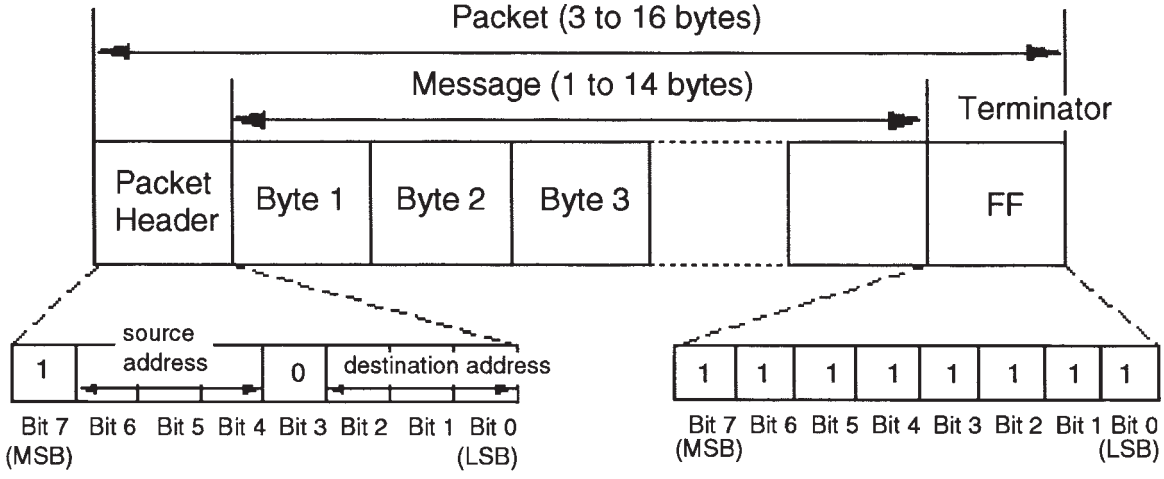


Fig. 7-6. VISCA Message Packet

7-3-2. Commands and Inquiries

Commands: Instruct the PCS-C150/C150P to carry out operations.
Inquiries: Instruct the PCS-C150/C150P to Inquire about the condition.

	Command Packet	Note
Command	8X 01 RR ... FF	RR = category code*
Inquiry	8X 09 RR ... FF	RR = category code*

*category code = 00 (Interface) , 04 (camera), 06 (pan/tilter)
*X = 1 to 7 : Address of PCS-C150/C150P.

7-3-3. Responses to Commands and Inquiries

ACK message: Returned by PCS-C150/C150P when it has received a command.
Completion message: Returned by PCS-C150/C150P when it has completed execution of a command or inquiry. Please notice that it is returned when the micon of the camera starts to carry out the operation. For example Pan/Tilt, Zoom Tele/Wide or Focus Far/Near, it is returned before it has completed execution. Inspection for an inquiry instruction, the response data is from the 3rd byte on of the message packet.

	Reply Packet	Note
Ack	X0 4Y FF	Y = socket number
Completion (commands)	X0 5Y FF	Y = socket number
Completion (Inquiries)	X0 5Y ... FF	Y = socket number

X = 9 to F : PCS-C150/C150P address + 8

Error message: The PCS-C150/C150P returnes an error message instead of a Completeion message when it cannot execute a command or inquiry instruction, or execution fails.

Error Packet	Description
X0 6Y 01 FF	Message length error (>14bytes)
X0 6Y 02 FF	Syntax Error
X0 6Y 03 FF	Command buffer full
X0 6Y 04 FF	Command cancelled
X0 6Y 05 FF	No socket (to be cancelled)
X0 6Y 41 FF	Time out
X0 6Y 43 FF	Condition Error

X = 1 to 7 : PCS-C150/C150P address, Y = socket number

7-3-4. Socket Number

When a command message is sent to a PCS-C150/C150P, the controller usually waits for the completion message or error message from that PCS-C150/C150P before sending the next message. However, in order to provide higher level usage, the PCS-C150/C150P has two command buffers (memories) so it can receive up to two commands (including the one it is executing) at a time. When the PCS-C150/C150P receives a command, it sets the socket number in the ACK message to tell the controller which command buffer is used.
Since this socket number is also included in the completion message or error message, the controller can see which command was completed. Even when the PCS-C150/C150P is using both commands and inquiries, no ACK message is returned, but rather a completion message with Socket Number 0 is returned.

7-3-5. Command Execution Stop

To cancel a command that you have already sent, send the IF_Clear cammand. To cancel just one cammand when you have already sent two, use a cancel.

	Cancel Packet	Note
Cancel	8X 2Y FF	Y = socket number

X = 1 to 7 : PCS-C150/C150P address, Y = socket number

7-4. PCS-C150/C150P Setting Commands (Network setting)

Before starting PCS-C150/C150P control, always broadcast the Address command and the IF_Clear command.

7-4-1. VISCA Network Management Commands

Address: Set the address for VISCA Equipments. This command is used when the network is initialized and when the network change message below is received.

Network Change: This command is sent from VISCA Equipments to the controller when a device is removed from or added to the network. When this message is received, the controller needs to reset the address.

	Packet	Notes
Address	88 30 01 FF	Always broadcasted.
Network Change	X0 38 FF	

X = 9 to F : PCS-C150/C150P address + 8

7-4-2. VISCA Interface Commands

IF_Clear: Clears the command buffers in the PCS-C150/C150P and stops the instruction being executed.

	Command Packet	Reply Packet
IF_Clear	8X 01 00 01 FF	X0 50 FF
IF_Clear (broadcast)	88 01 00 01 FF	88 01 00 01 FF

X = 1 to 7 : PCS-C150/C150P address (Inquiry packet)
= 9 to F : PCS-C150/C150P address + 8 (reply packet)

7-4-3. PCS-C150/C150P Functions

CAM_WB

1) Auto white balance (AWB)
   For this unit's AWB, the TTL method is adopted to reproduce the colors of the subject as closely as possible by calculating the color data of the whole screen.
   Furthermore, the white balance area is limited to prevent operations that show all objects as white from being performed when white balance operations are performed.
   The area for performing the auto white balance is also changed by determining whether it is indoors or outdoors according to the brightness.

2) Preset white balance
   The preset white balance can be selected from fixed indoors (3200K) and fixed outdoors (5800K).

3) One push white balance
   The one push white balance is a function which, when once the subject is set to certain lighting conditions, will expose the subject under these conditions by gaining white forcibly.
   The color is reproduced naturally without being affected by the surrounding conditions of the subject.
   When set, the one-push white balance trigger is sent assuming that the white subject occupies more than 1/2 of the screen.
   The one-push white balance data is provided when the lithium backup SW is ON even though the power is off (2 hours for fully-charged battery).When the lithium backup SW is off, the data will be lost when the power is turned off. Therefore, when turning off the power, set the one-push white balance again.

CAM_AE

1) Full auto
   When the automatic exposure (AE) mode is set, the auto-iris, AGC (auto-gain), 1/60 sec shutter (PCS-C150P is 1/50 sec shutter) will operate.
   When the power supply is turned on with the lithium backup off, the automatic exposure mode will be set.

2) Manual
   When the manual mode is set, iris, gain and shutter will be set separately.

3) Bright Control
   Bright Control is an adjustment function of the brightness with the combination of gain and iris. When in darkness, gain controls exposure and when in the brightness, iris controls exposure. Since both gain and iris are fixed, this function is useful when capturing images under fixed brightness condition. The status at auto exposure will be held once when changing the mode from auto exposure to Bright Control.

STEP	GAIN	IRIS	STEP	GAIN	IRIS	STEP	GAIN	IRIS
1	18dB	F1.8	9	0dB	F2.4	17	0dB	F9.6
2	15dB	F1.8	10	0dB	F2.8	18	0dB	F11
3	12dB	F1.8	11	0dB	F3.4	19	0dB	F14
4	9dB	F1.8	12	0dB	F4	20	0dB	F16
5	6dB	F1.8	13	0dB	F4.8	21	0dB	F19
6	3dB	F1.8	14	0dB	F5.6	22	0dB	F22
7	0dB	F1.8	15	0dB	F6.8	23	0dB	F28
8	0dB	F2.0	16	0dB	F8	24	0dB	CLOSE

Table. 7-1.

4) Shutter priority mode
   The iris value is automatically adjusted to the electronic shutter selected (28 levels). Gain is also adjusted automatically.

5) Iris priority mode
   Corresponding to selected iris position (17 different positions), shutter speed is adjusted automatically. Gain is in auto mode.

CAM_Back light

The backlight compensation function increases the brightness in the automatic exposure mode and shutter priority exposure mode (auto-iris AGC). It is useful for correcting the images of subjects which have turned out dark due to background light (sunlight, lamps, etc.).
The brightness, when this function is off (auto iris, AGC), is taken as a reference, and the brightness can be increased up to 12 dB. Although the subject becomes brighter, the background will become white and saturate.
The iris and gain operations remain in the auto mode.

CAM_Position Preset

Camera functions can be preset in 6 different ways using the position preset function.
Using this function pan/tilt, zoom position, focus (auto, manual positions), white balance, shutter, bright control (iris, gain) can be set to the desired state instantaneously without adjusting backlight compensation each time.

7-5. PCS-C150/C150P Commands

Command Set	Command	VISCA Packet	Comments
CAM_Power	On	8x 01 04 00 02 FF	
	Off	8x 01 04 00 03 FF	
CAM_Zoom	Stop	8x 01 04 07 00 FF	
	Tele (Standard)	8x 01 04 07 02 FF	
	Wide (Standard)	8x 01 04 07 03 FF	
	Tele (Variable)	8x 01 04 07 2Z FF	Z : 2 (low speed) to 7 (high speed)
	Wide (Variable)	8x 01 04 07 3Z FF	
	Direct	8x 01 04 47 0Z 0Z 0Z 0Z FF	ZZZZ : 0000 (Wide) to 03FF (Tele)
CAM_Focus	Stop	8x 01 04 08 00 FF	
	Far	8x 01 04 08 02 FF	
	Near	8x 01 04 08 03 FF	
	Auto focus on	8x 01 04 38 02 FF	
	Manual focus on	8x 01 04 38 03 FF	
	Auto/Manual	8x 01 04 38 10 FF	
	Direct	8x 01 04 48 0Z 0Z 0Z 0Z FF	ZZZZ : 0000 to FFFF The relation between the data and distance is not linear
CAM_WB	Auto	8x 01 04 35 00 FF	
	Indoor mode	8x 01 04 35 01 FF	
	Outdoor mode	8x 01 04 35 02 FF	
	OnePush mode	8x 01 04 35 03 FF	
	OnePush trigger	8x 01 04 10 05 FF	
CAM_AE	Full Auto	8x 01 04 39 00 FF	
	Manual	8x 01 04 39 03 FF	
	Shutter priority	8x 01 04 39 0A FF	
	Iris priority	8x 01 04 39 0B FF	
	Bright control	8x 01 04 39 0D FF	
CAM_Bright	Reset	8x 01 04 0D 00 FF	
	Up	8x 01 04 0D 02 FF	
	Down	8x 01 04 0D 03 FF	
CAM_Shutter	Reset	8x 01 04 0A 00 FF	
	Up	8x 01 04 0A 02 FF	
	Down	8x 01 04 0A 03 FF	
	Direct	8x 01 04 4A 0Z 0Z 0Z 0Z FF	ZZZZ : 0000 (1/60) to 001B (1/10000sec.)

Table. 7-2 (1).

Command Set	Command	VISCA Packet	Comments
CAM_Iris	Reset	8x 01 04 0B 00 FF	
	Up	8x 01 04 0B 02 FF	
	Down	8x 01 04 0B 03 FF	
	Direct	8x 01 04 4B 0Z 0Z 0Z 0Z FF	ZZZZ : 0000 (CLOSE) to 0011 (F1.8)
CAM_Gain	Reset	8x 01 04 0C 00 FF	
	Up	8x 01 04 0C 02 FF	
	Down	8x 01 04 0C 03 FF	
	Direct	8x 01 04 4C 0Z 0Z 0Z 0Z FF	ZZZZ : 0000 (0dB) to 0007 (+18dB)
CAM_Backlight	On	8x 01 04 33 02 FF	
	Off	8x 01 04 33 03 FF	
CAM_Preset	Reset	8x 01 04 3F 00 0Z FF	Z : 0 (position1) to 5 (position6)
	Set	8x 01 04 3F 01 0Z FF	
	Recall	8x 01 04 3F 02 0Z FF	
CAM_KeyLock	Off	8x 01 04 17 00 FF	
	On	8x 01 04 17 02 FF	
IR_Receive	On	8x 01 06 08 02 FF	
	Off	8x 01 06 08 03 FF	not receive IR
	On/Off	8x 01 06 08 10 FF	
IR_ReceiveReturn	On	8x 01 7D 01 03 00 00 FF	When receive IR, output the data.
	Off	8x 01 7D 01 13 00 00 FF	
Wide_conLensSet		8x 01 07 26 00 0Z FF	When using wide con lens, compensats AT sensitivity. Z : 0 (not using) to 7 (x0.6)
AddressSet	broadcast	88 30 01 FF	refer to 7-4 page
		8x 30 01 FF	
IF_Clear	broadcast	88 01 00 01 FF	refer to 7-4 page
		8x 01 00 01 FF	
CommandCancel		8x 2Z FF	Z : socket No. 0 or 1

Table. 7-2 (2).

Command Set	Command	VISCA Packet	Comments
Pan-tiltDrive	Up	8x 01 06 01 VV WW 03 01 FF	VV : pan speed 01 to 18 (01 to 1C for D31)
	Down	8x 01 06 01 VV WW 03 02 FF	WW : tilt speed 01 to 14 (01 to 18 for D31)
	Left	8x 01 06 01 VV WW 01 03 FF	
	Right	8x 01 06 01 VV WW 02 03 FF	
	UpLeft	8x 01 06 01 VV WW 01 01 FF	
	UpRight	8x 01 06 01 VV WW 02 01 FF	
	DownLeft	8x 01 06 01 VV WW 01 02 FF	
	DownRight	8x 01 06 01 VV WW 02 02 FF	
	Stop	8x 01 06 01 VV WW 03 03 FF	
	Absolute position	8x 01 06 02 VV WW 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF	YYYY : pan position FC90 to 0370 (center 0000) ZZZZ : tilt position FED4 to 012C (center 0000) W : 0 UpRight, 1 DownLeft
	Relative position	8x 01 06 03 VV WW 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF	
	Home	8x 01 06 04 FF	
	Reset	8x 01 06 05 FF	
Pan-tiltLimitSet	Limit set	8x 01 06 07 00 0W 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF	YYYY : pan position FC90 to 0370 (center 0000) ZZZZ : tilt position FED4 to 012C (center 0000) W : 0 UpRight, 1 DownLeft
	Limit clear	8x 01 06 07 01 0W 07 0F 0F 0F 07 0F 0F 0F FF	
DataScreen	On	8x 01 06 06 02 FF	
	Off	8x 01 06 06 03 FF	
	On/Off	8x 01 06 06 10 FF	
AT_Mode	On	8x 01 07 01 02 FF	
	Off	8x 01 07 01 03 FF	
	On/Off	8x 01 07 01 10 FF	
AT_AE	On	8x 01 07 02 02 FF	
	Off	8x 01 07 02 03 FF	
	On/Off	8x 01 07 02 10 FF	
AT_AutoZoom	On	8x 01 07 03 02 FF	
	Off	8x 01 07 03 03 FF	
	On/Off	8x 01 07 03 10 FF	
AT/MD_ Frame _Display	On	8x 01 07 04 02 FF	
	Off	8x 01 07 04 03 FF	
	On/Off	8x 01 07 04 10 FF	

Command Set	Command	VISCA Packet	Comments
AT_Offset	On	8x 01 07 05 02 FF	
	Off	8x 01 07 05 03 FF	
	On/Off	8x 01 07 05 10 FF	
AT/MD_Start/Stop	Start/Stop	8x 01 07 06 10 FF	
AT_Chase	Chase1	8x 01 07 07 00 FF	
	Chase2	8x 01 07 07 01 FF	
	Chase3	8x 01 07 07 02 FF	
AT_Entry	Entry1	8x 01 07 15 00 FF	
	Entry2	8x 01 07 15 01 FF	
	Entry3	8x 01 07 15 02 FF	
	Entry4	8x 01 07 15 03 FF	
MD_Mode	On	8x 01 07 08 02 FF	
	Off	8x 01 07 08 03 FF	
	On/Off	8x 01 07 08 10 FF	
MD_Frame	Setting	8x 01 07 09 FF	
MD_Detect	Frame1/2/1 or 2	8x 01 07 0A 10 FF	
AT_LostInfo		8x 01 06 20 07 20 FF	
MD_LostInfo		8x 01 06 20 07 21 FF	
MD_Adjust	Y Level	8x 01 07 0B 00 0Z FF	Z=0 to F
	Hue Level	8x 01 07 0C 00 0Z FF	
	Size	8x 01 07 0D 00 0Z FF	
	Display time	8x 01 07 0F 00 0Z FF	
	Refresh mode1	8x 01 07 10 00 FF	
	Refresh mode2	8x 01 07 10 01 FF	
	Refresh mode3	8x 01 07 10 02 FF	
	Refresh time	8x 01 07 0B 00 0Z FF	Z=0 to F

Table. 7-2 (3).

7-6. PCS-C150/C150P Inquiry Commands

Inquiry	Packet Inq	Packet Reply	Description
CAM_PowerInq	8x 09 04 00 FF	Y0 50 02 FF	On
		Y0 50 03 FF	Off
CAM_ZoomPosInq	8x 09 04 47 FF	Y0 50 0Z 0Z 0Z 0Z FF	ZZZZ : 0000 to 03FF
CAM_FocusAFModeInq	8x 09 04 38 FF	Y0 50 02 FF	Auto
		Y0 50 03 FF	Manual
CAM_FocusPosInq	8x 09 04 48 FF	Y0 50 0Z 0Z 0Z 0Z FF	ZZZZ : 0000 to FFFF
CAM_WBModeInq	8x 09 04 35 FF	Y0 50 00 FF	Auto
		Y0 50 01 FF	Indoor mode
		Y0 50 02 FF	Outdoor mode
		Y0 50 03 FF	OnePush mode
CAM_AEModeInq	8x 09 04 39 FF	Y0 50 00 FF	Full Auto
		Y0 50 03 FF	Manual
		Y0 50 0A FF	Shutter priority
		Y0 50 0B FF	Iris priority
		Y0 50 0D FF	Bright control
CAM_ShutterPosInq	8x 09 04 4A FF	Y0 50 0Z 0Z 0Z 0Z FF	ZZZZ : position
CAM_IrisPosInq	8x 09 04 4B FF	Y0 50 0Z 0Z 0Z 0Z FF	ZZZZ : position
CAM_GainPosInq	8x 09 04 4C FF	Y0 50 0Z 0Z 0Z 0Z FF	ZZZZ : position
CAM_Backlight	8x 09 04 33 FF	Y0 50 02 FF	On
ModeInq		Y0 50 03 FF	Off
CAM_MemoryInq	8x 09 04 3F FF	Y0 50 0Z FF	Z : 0 to 5
CAM_KeyLockInq	8x 09 04 17 FF	Y0 50 00 FF	Off
		Y0 50 02 FF	On
CAM_IDInq	8x 09 04 22 FF	Y0 50 0Z 0Z FF	ZZ : ID
VideoSystemInq	8x 09 06 23 FF	Y0 50 00 FF	NTSC
		Y0 50 01 FF	PAL
Wide_conLensInq	8x 09 07 26 FF	Y0 50 00 0Z FF	Z : lens No.
Pan-tiltModeInq	8x 09 06 10 FF	Y0 50 0Z 0Z 0Z 0Z FF	ZZZZ : status
Pan-tiltMaxSpeedInq	8x 09 06 11 FF	Y0 50 WW ZZ FF	WW : pan (00 to 18), ZZ : tilt (00 to 14)
Pan-tiltPosInq	8x 09 06 12 FF	Y0 50 0W 0W 0W 0W	WWWW : pan (FC90 to 0370)
		0Z 0Z 0Z 0Z FF	ZZZZ : tilt (FED4 to 012C)
IR_ReceiveModeInq	8x 09 06 08 FF	Y0 50 02 FF	On
		Y0 50 03 FF	Off

Inquiry	Packet Inq	Packet Reply	Description
DatascreenInq	8x 09 06 06 FF	Y0 50 02 FF	On
		Y0 50 03 FF	Off
AT/MD_ModeInq	8x 09 07 22 FF	Y0 50 00 FF	Normal mode
		Y0 50 01 FF	AT mode
		Y0 50 02 FF	MD mode
AT_ModeInq	8x 09 07 23 FF	Y0 50 ZZ ZZ FF	ZZZZ : status
AT_EntryInq	8x 09 07 15 FF	Y0 50 00 FF	entry mode1
		Y0 50 01 FF	entry mode2
		Y0 50 02 FF	entry mode3
		Y0 50 03 FF	entry mode4
MD_ModeInq	8x 09 07 24 FF	Y0 50 ZZ ZZ FF	ZZZZ : status
AT_ObjectPosInq	8x 09 07 20 FF	Y0 50 VV WW ZZ FF	VV : X (04 to 2A), WW : Y (03 to 1B) ZZ : status 00 (setting), 01 (working), 10 (lost a subject), 11 (memorizing)
MD_ObjectPosInq	8x 09 07 21 FF	Y0 50 VV WW ZZ FF	VV : X (04 to 2A), WW : Y (03 to 1B) ZZ : status 00 (setting), 01 (undetect), 02 (detecting), 11 (memorizing)
MD_Y LevelInq	8x 09 07 0B FF	Y0 50 00 0Z FF	Z : 0 to F
MD_Hue LevelInq	8x 09 07 0C FF	Y0 50 00 0Z FF	
MD_SizeInq	8x 09 07 0D FF	Y0 50 00 0Z FF	
MD_Disp. TimeInq	8x 09 07 0F FF	Y0 50 00 0Z FF	
MD_Ref. ModeInq	8x 09 07 10 FF	Y0 50 00 FF	Refresh mode1
		Y0 50 01 FF	Refresh mode2
		Y0 50 02 FF	Refresh mode3
MD_Ref. TimeInq	8x 09 07 11 FF	Y0 50 00 0Z FF	Z : 0 to F
IR_ReceiveReturn		Y0 07 7D 01 04 00 FF	Power ON/OFF
		Y0 07 7D 01 04 07 FF	Zoom Tele/Wide
		Y0 07 7D 01 04 38 FF	AF ON/OFF
		Y0 07 7D 01 04 33 FF	CAM_Backlight
		Y0 07 7D 01 04 3F FF	CAM_Memory
		Y0 07 7D 01 06 FF	Pan-tiltDrive
		Y0 07 7D 01 07 23 FF	AT_Mode ON/OFF
		Y0 07 7D 01 07 24 FF	MD_Mode ON/OFF

Table. 7-3

7-7. Code List

7-7-1. Code list for Shutter, Iris, Gain and Wide con lens

Code	Shutter (1/X sec.)	Iris	Gain (dB)
0	60 (D31 : 50)	CLOSE	– 3
1	60	F28	0
2	75	F22	3
3	90	F19	6
4	100	F16	9
5	125 (D31 : 120)	F14	12
6	150	F11	15
7	180	F9.6	18
8	215	F8	
9	250	F6.8	
A	300	F5.6	
B	350	F4.8	
C	425	F4	
D	500	F3.4	
E	600	F2.8	
F	725	F2.4	
10	850	F2	
11	1000	F1.8	
12	1250		
13	1500		
14	1750		
15	2000		
16	2500		
17	3000		
18	3500		
19	4000		
1A	6000		
1B	10000		

Table. 7-4

Code	Wide Con lens No.
0	1.0
1	0.9
2	0.85
3	0.8
4	0.75
5	0.7
6	0.65
7	0.6

Table. 7-5

7-7-2. Code list for Pan/Tilter status, AT mode status and MD mode status

Code list for Pan/Tilter status

Z	Z	Z	Z	
0 - - -	- - - -	0 - - -	- - - 1	Pan left end
0 - - -	- - - -	0 - - -	- - 1 -	Pan right end
0 - - -	- - - -	0 - - -	- 1 - -	Tilt up end
0 - - -	- - - -	0 - - -	1 - - -	Tilt down end
0 - - -	- - - -	- - 00	- - - -	Pan normal
0 - - -	- - - -	- - 01	- - - -	Pan position error
0 - - -	- - - -	- - 10	- - - -	Pan mechanical failure
0 - - -	- - 00	0 - - -	- - - -	Tilt normal
0 - - -	- - 01	0 - - -	- - - -	Tilt position error
0 - - -	- - 10	0 - - -	- - - -	Tilt mechanical failure
0 - - -	00 - -	0 - - -	- - - -	Pan/Tilt no move
0 - - -	01 - -	0 - - -	- - - -	Pan/Tilt moving
0 - - -	10 - -	0 - - -	- - - -	Pan/Tilt moving finished
0 - - -	11 - -	0 - - -	- - - -	Pan/Tilt moving failed
0 - 00	- - - -	0 - - -	- - - -	Pan/Tilt not initialized
0 - 01	- - - -	0 - - -	- - - -	Pan/Tilt under initialize
0 - 10	- - - -	0 - - -	- - - -	Pan/Tilt initialize finished
0 - 11	- - - -	0 - - -	- - - -	Pan/Tilt initialize failed

Code list for AT mode status

Z	Z	Z	Z	
0 - - -	- - - -	0 - - -	- - 00	AT frame chase
0 - - -	- - - -	0 - - -	- - 01	AT pan chase
0 - - -	- - - -	0 - - -	- - 10	AT frame/pan chase
0 - - -	- - - -	0 - - -	- 1 - -	AT offset
0 - - -	- - - -	0 - - -	1 - - -	AT AE on/off
0 - - -	- - - -	0 - -1	- - - -	AT zoom on/off
0 - - -	- - - -	0 - 1-	- - - -	AT frame display on/off
0 - - -	- - 00	0 - - -	- - - -	AT setting
0 - - -	- - 01	0 - - -	- - - -	AT working
0 - - -	- - 10	0 - - -	- - - -	AT lost
0 - - -	- - 11	0 - - -	- - - -	At memorizing

Code list for MD mode status

Z	Z	Z	Z	
0 - - -	- - - -	0 - - -	-000	MD deteciton method
0 - - -	- - - -	0 - - -	- 001	MD setting
0 - - -	- - - -	0 - - -	- 01x	MD undetect
0 - - -	- - - -	0 - - -	- 10x	MD detecing
0 - - -	- - - -	0 - - -	- 11x	MD memorizing
0 - - -	- - - -	0 - - 0	1 - - -	MD frame 1
0 - - -	- - - -	0 - - 1	0 - - -	MD frame 2
0 - - -	- - - -	0 - - 1	1 - - -	MD frame 1 or 2
0 - - -	- - - -	0 - 1 -	0 - 1 -	MD frame display

Table. 7-6

7-8. VISCA Communications Examples

Network initialization (The receiving data is for when 3 VISCA devices are connected.)

Sending	Receiving	Function
88 01 00 01 FF		Clear message (broadcast)
	88 01 00 01 FF	Reply to Clear message
88 30 01 FF		Address message (broadcast)
	88 30 04 FF	Reply to Address message (broadcast)

The 3rd byte of the reply to an address message is the number of connected devices plus 1. In this example, three devices are connected, so this byte is 04.

Setting the focus position of the first PCS-C150/C150P to 0105H.

Sending	Receiving	Function
88 01 04 48 00 01 00 05 FF		Focus Direct command
	90 41 FF	ACK of Focus Direct command
	90 51 FF	Focus Direct command completed

Setting the focus position of the first PCS-C150/C150P to 0105H.

Sending	Receiving	Function
81 01 04 07 02 FF		Zoom Tele command
	90 41 FF	ACK of Zoom Tele command
	90 51 FF	Zoom Tele command completed (zoom tele starts)
81 01 04 07 00 FF		Zoom Stop command
	90 41 FF	ACK of Zoom Stop command
	90 51 FF	Zoom Stop command completed (zoom tele stops)

CAM_Zoom Tele/Wide and CAM_Focus Far/Near work until Camera_Zoom Stop, Camera_Focus Stop or other command is sent. CAM_Zoom Tele/Wide and CAM_Focus Far/Near can not be sent simultaniousely.

Inquiry about whether AF is ON or OFF, the position of zoom and the position of focus.
(In case it is inquired continually)

Sending	Receiving	Function
81 09 04 47 FF		ZoomInq command
	90 41 FF	ACK of ZoomInq command (socket 1)
81 09 04 38 FF		AFModeInq command
	90 50 02 FF	Auto Focus Mode
81 09 04 48 FF		FocusInq command
	90 42 FF	ACK of FocusInq command (socket 2)
	90 51 00 02 01 0E FF	Zoom Position 021EH (socket 1)
	90 52 00 01 00 05 FF	Focus Position 0105H (socket 2)

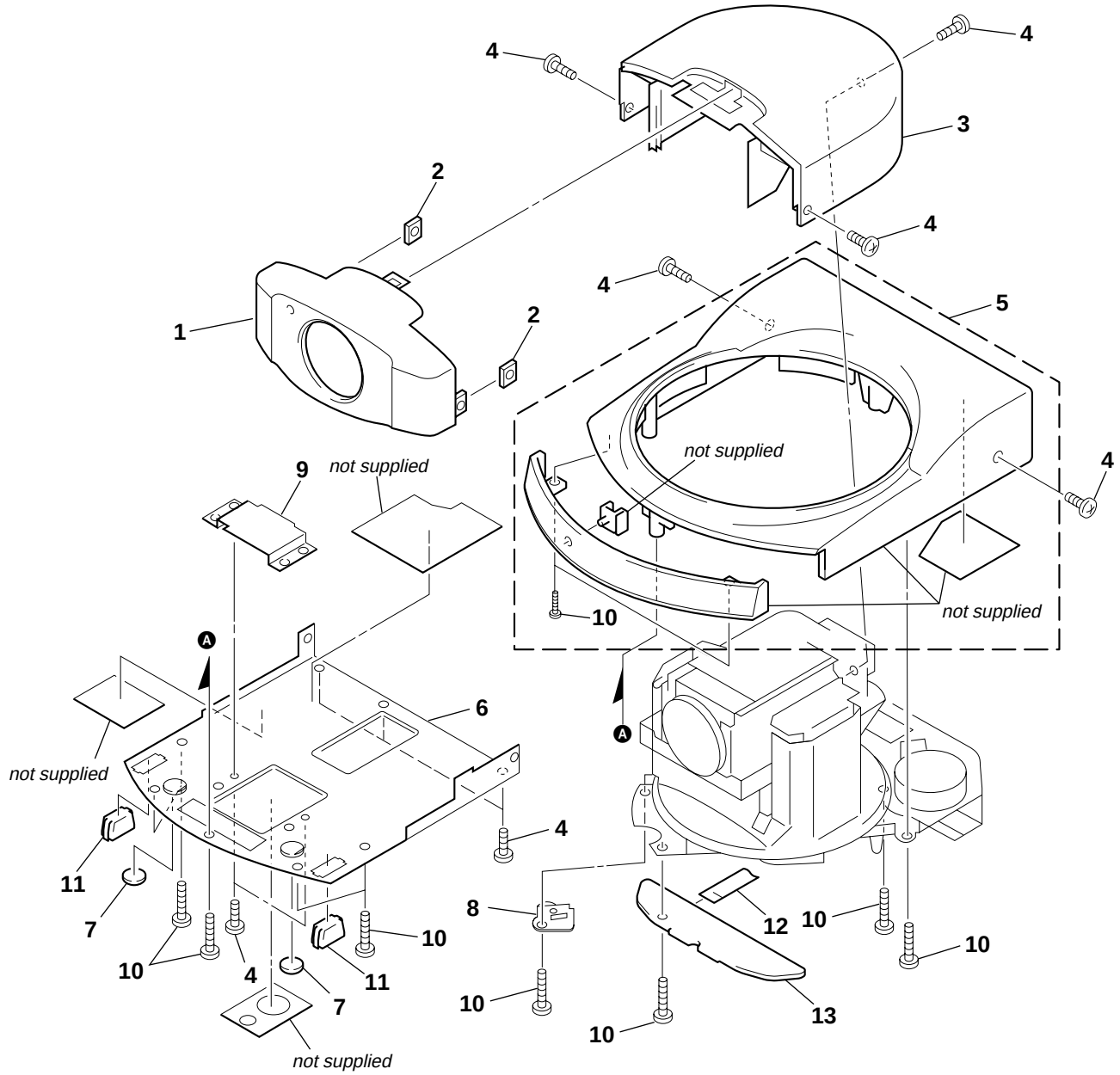
In case of Inquiry command, it might take around 0.5 second to receive the reply after the command is sent.
In case of sending the second command before receiving the first reply, ACK socket number and the completion message socket number should be checked.

SECTION 8
REPAIR PARTS LIST

8-1. EXPLODED VIEWS

NOTE:
- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- Hardware (# mark) list and accessories and packing materials are given in the last of this parts list.

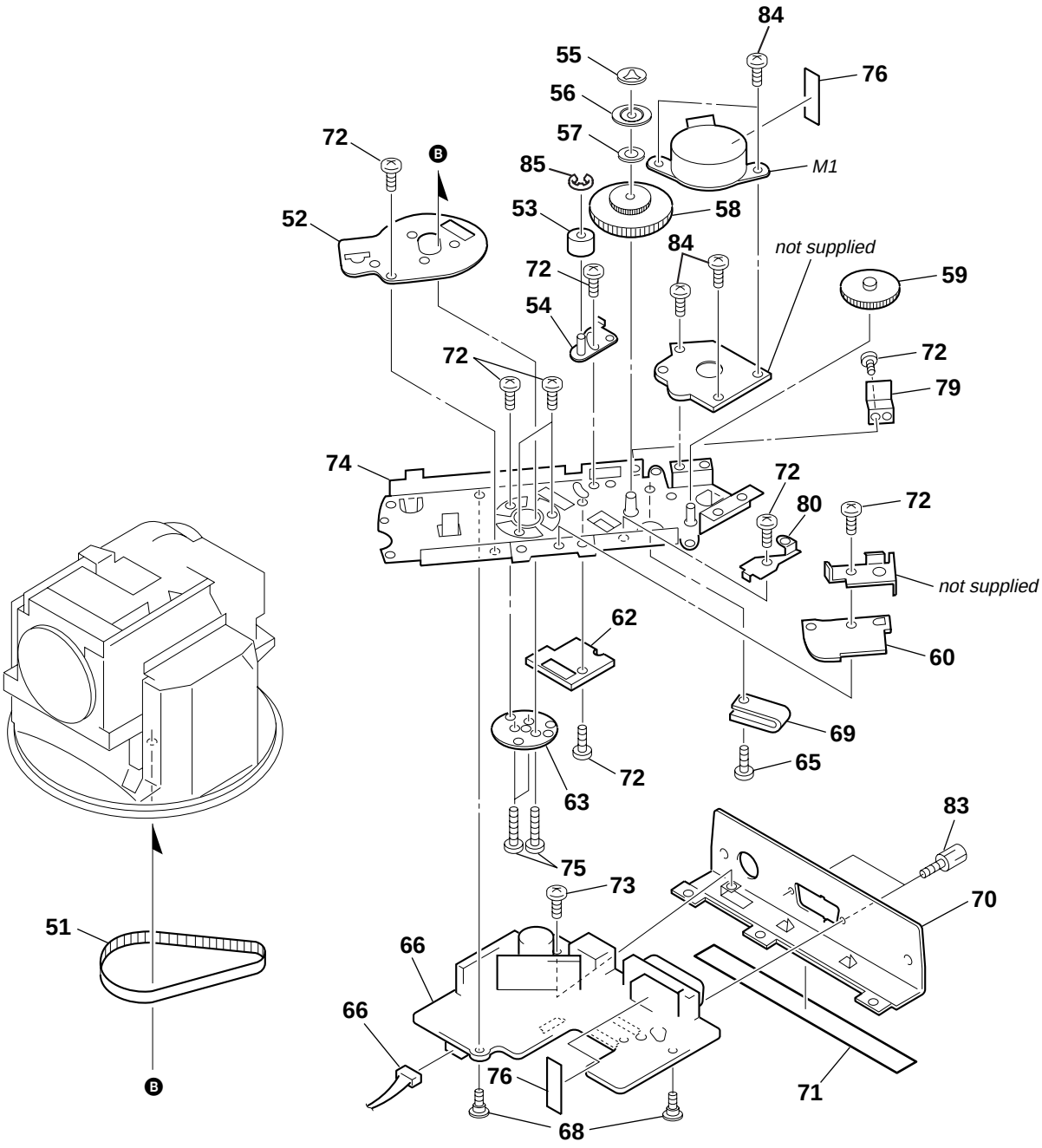
8-1-1. CAMERA CABINET SECTION



Ref. No.	Part No.	Description	Remark
* 1	X-3947-109-1	CABINET (FRONT) ASSY, CAMERA	
2	3-718-233-01	NUT, PLATE	
3	3-971-324-02	CABINET (UPPER), CAMERA	
4	3-719-381-01	SCREW (M2X4)	
* 5	X-3168-166-1	CABINET ASSY, MAIN	
* 6	X-3168-165-1	PLATE ASSY, BOTTOM	
7	3-740-607-01	CUSHION	

Ref. No.	Part No.	Description	Remark
* 8	3-971-400-01	PLATE (P), GROUND	
* 9	3-971-383-01	LID, TRIPOD	
10	3-971-322-01	SCREW (2.6X8)	
* 11	3-202-553-01	GUIDE, CAMERA	
12	1-177-304-11	FLAT CABLE, 7P	
* 13	A-8056-257-A	RM-77A (A) MOUNT	

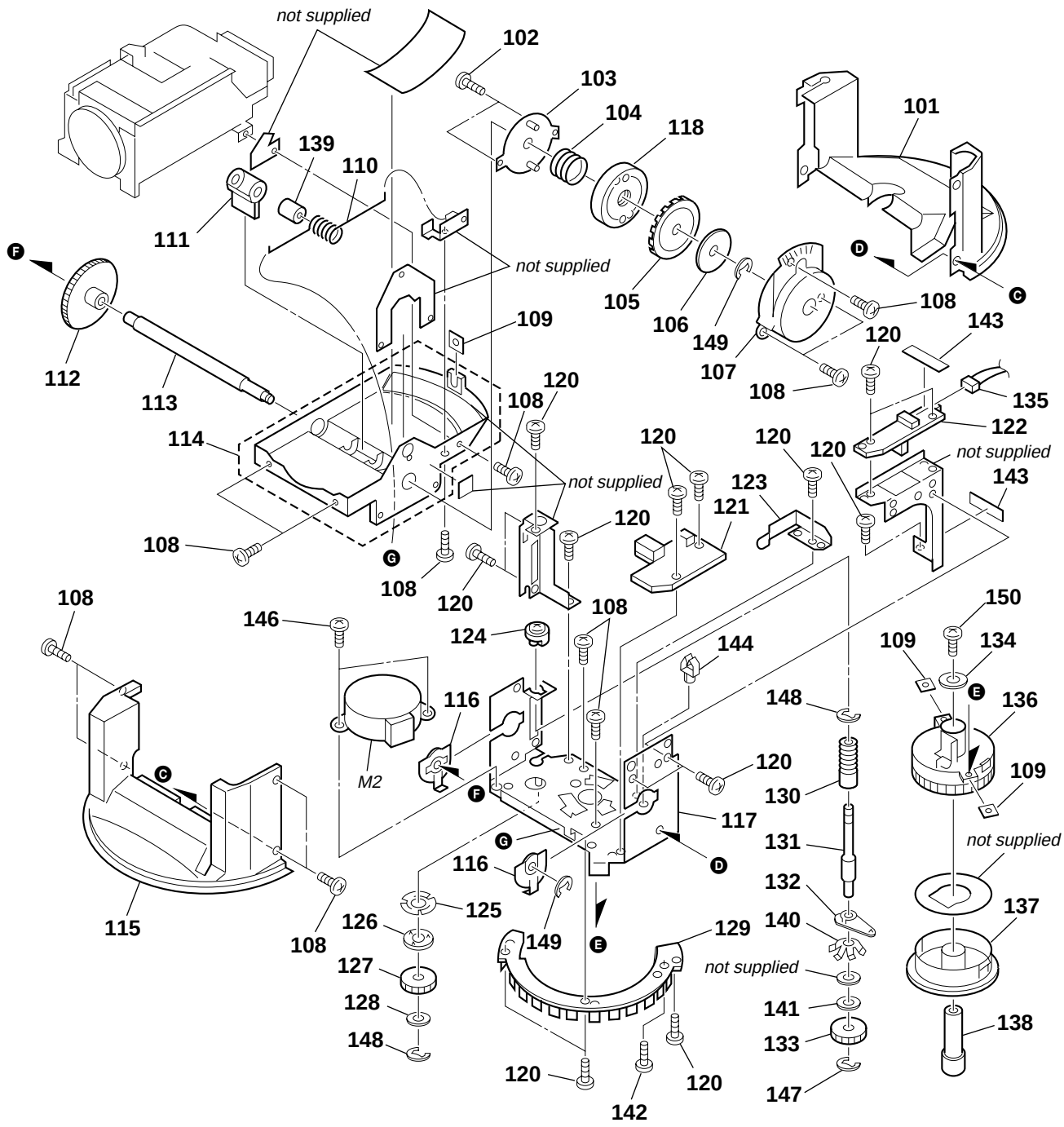
8-1-2. PAN BASE SECTION



Ref. No.	Part No.	Description	Remark
51	3-971-346-01	BELT, TIMING	
52	3-972-548-01	PLATE, PAN SLIDER	
53	3-971-354-01	PULLEY, TENSION	
* 54	X-3946-396-1	ARM ASSY, PULLEY	
* 55	3-650-537-01	WASHER	
56	3-971-398-01	STOPPER, BELT EXTRACT	
57	3-972-547-01	WASHER, PULLEY	
58	3-971-343-01	PULLEY	
59	3-971-342-01	GEAR, PAN DECELERATION	
* 60	1-674-603-11	PWB, LI-55A	
* 62	3-971-640-01	HOLDER (UPPER), PAN	
* 63	3-971-399-01	BRACKET, MAIN SHAFT	
65	3-719-381-71	SCREW (M2X8)	
* 66	A-8056-250-A	ID-11A (A) MOUNT	
68	3-730-107-01	SCREW (M2X2.2)	
* 69	3-971-641-01	HOLDER (LOWER), PAN	

Ref. No.	Part No.	Description	Remark
* 70	3-202-552-01	PANEL, REAR	
71	3-971-634-01	FOOT (REAR)	
72	3-719-381-01	SCREW (M2X4)	
73	3-713-786-91	SCREW (M2X3)	
* 74	X-3946-394-2	BASE ASSY, PAN	
75	3-719-381-21	SCREW (M2X6)	
76	3-849-226-01	CLOTH, UNWEAVED (25X6X0.5)	
77	1-956-267-11	HARNESS (IL-52)	
78	1-777-302-11	CABLE, FLEXIBLE FLAT 14P	
79	3-973-626-01	STOPPER, P	
80	3-973-625-02	SPRING, PULLEY	
83	3-668-459-31	SEREW (for connect)	
84	4-906-127-01	SCREW (3X4)(G), TAPPING, (+)P	
85	7-624-104-04	STOP RING 2.0, TYPE-E	
M1	1-698-797-12	MOTOR, DC (STEPPING MOTOR) (PAN)	

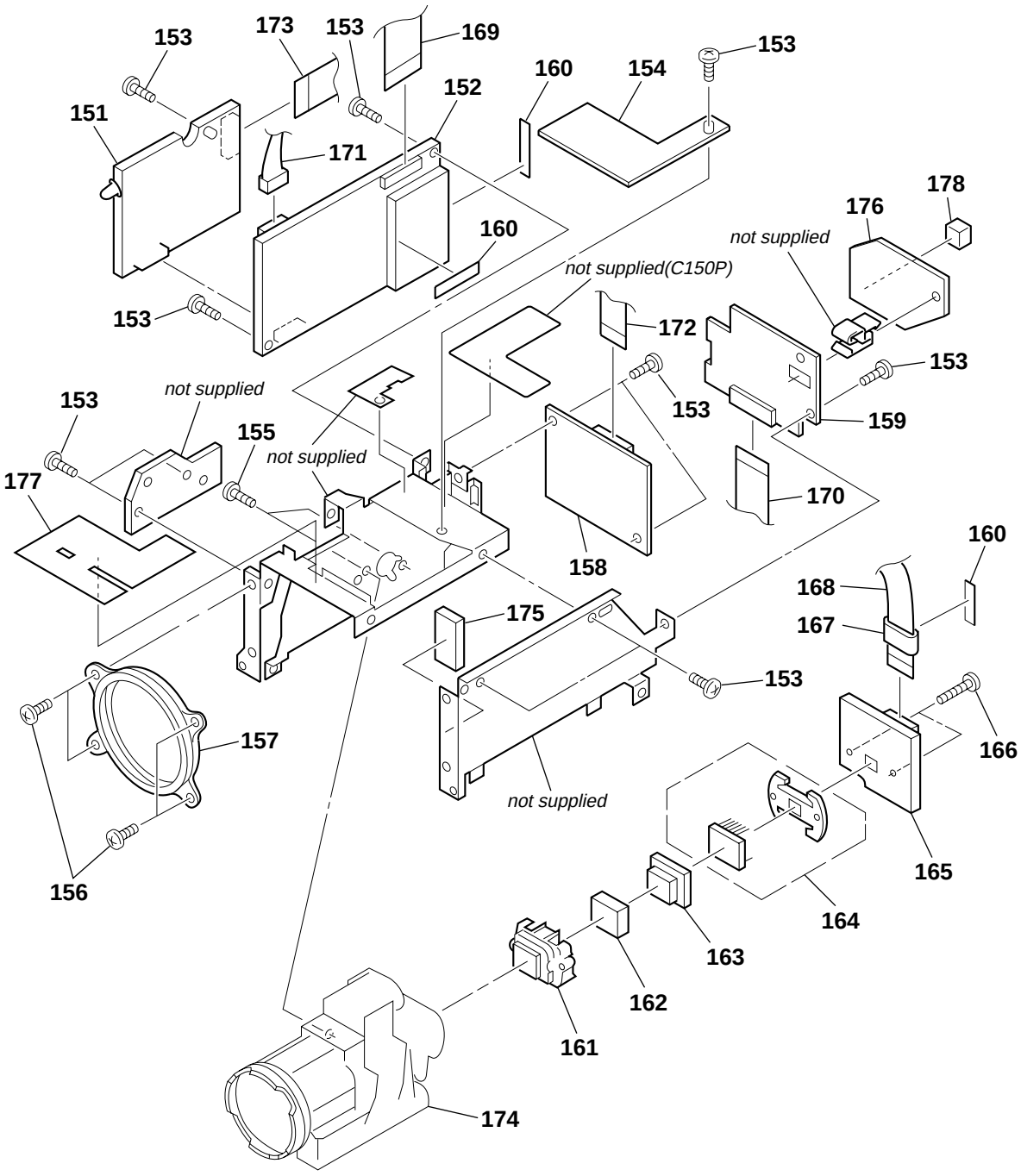
8-1-3. TILT BASE SECTION



Ref. No.	Part No.	Description	Remark
101	3-971-362-02	CABINET (REAR), PAN	
102	3-945-884-31	SCREW	
* 103	X-3946-397-1	RETAINER ASSY	
104	3-971-368-01	SPRING, COMPRESSION	
105	3-971-372-01	DISK	
106	3-971-374-01	REINFORCEMENT, ROTARY	
107	3-971-328-03	CASE, CLUTCH	
108	3-719-381-01	SCREW (M2X4)	
109	3-718-233-01	NUT, PLATE	
110	3-971-360-01	SPRING, TORSION	
111	3-971-327-01	JOINT, FLEXIBLE	
112	3-971-357-01	GEAR, TILT	
* 113	3-971-329-01	SHAFT, TILT	
114	X-4622-328-1	CABINET ASSY (LOWER), CAMERA	
115	3-971-361-02	CABINET (FRONT), PAN	
116	3-971-330-01	BEARING, TILT	
* 117	X-3946-395-1	BASE ASSY, TILT	
118	3-971-367-01	PLATE, CLICK	
120	3-713-786-91	SCREW (M2X3)	
* 121	1-674-602-11	PWB, LI-52A (A)	
* 122	1-674-604-11	PWB, LI-59A (A)	
* 123	3-971-349-01	PLATE, MAIN SHAFT GROUND	
124	3-971-341-01	BEARING (B), WORM	
125	3-971-636-01	SPRING, FRICTION	
* 126	3-971-639-01	PLATE, GEAR	

Ref. No.	Part No.	Description	Remark
127	3-971-334-01	GEAR, TILT DECELERATION	
128	3-701-439-11	WASHER	
* 129	3-971-377-02	WING, PAN SENSOR	
130	3-971-356-02	GEAR, WORM	
131	3-971-335-01	SHAFT, TILT WORM	
132	3-971-340-01	BEARING (A), WORM	
133	3-971-333-01	GEAR, TILT (MIDWAY)	
134	3-971-323-01	WASHER	
135	1-956-270-11	HARNESS (LL-51)	
136	3-971-364-01	BEARING, MAIN SHAFT	
137	3-971-344-01	PULLEY, PAN	
138	3-971-348-01	SHAFT, MAIN	
139	3-973-487-01	SLEEVE, TILT	
140	3-973-488-01	SPRING, T FRICTION	
141	3-973-489-01	WASHER, T	
142	3-948-339-41	SCREW, TAPPING	
143	3-849-226-01	CLOTH, UNWEAVED (25X6X0.5)	
144	3-972-239-01	CLAMP, MINIATURE	
146	4-906-127-01	SCREW (3X4) (G), TAPPING, (+)P	
147	7-624-102-04	STOP RING 1.5, TYPE-E	
148	7-624-104-04	STOP RING 2.0, TYPE-E	
149	7-624-106-04	STOP RING 3.0, TYPE-E	
150	7-682-647-09	SCREW +PS 3X6	
M2	1-698-797-22	MOTOR, DC (STEPPING MOTOR) (TILT)	

8-1-4. LENS SECTION



Ref. No.	Part No.	Description	Remark
* 151	A-8056-258-A	AT-21A (A) MOUNT	
* 152	A-7072-759-A	VC-179 (A) MOUNT (C150)	
* 152	A-7072-790-A	VC-179 (B) MOUNT (C150P)	
153	3-713-786-21	SCREW (M2X3)	
* 154	A-8056-252-A	LD-84A (A) MOUNTED PWB (C150)	
* 154	A-8056-259-A	LD-84A (B) MOUNTED PWB (C150P)	
155	3-945-884-31	SCREW	
156	3-971-319-01	SCREW (M2.6X3)	
* 157	3-956-683-21	ADAPTOR, F FITTING	
* 158	A-7072-760-A	MD-68 (A) MOUNT	
* 159	A-8056-256-A	RS-67A (A) MOUNT	
160	3-849-226-01	CLOTH, UNWEAVED (25X6X0.5)	
161	3-946-856-11	ADAPTOR (H), CCD FITTING	
162	1-547-735-51	FILTER BLOCK, OPTICAL	
163	3-960-149-11	RUBBER (3), SEAL	
164	A-8045-273-A	CCD BLOCK ASSY (AUTO) (C150)	
164	A-8045-279-A	CCD BLOCK ASSY (AUTO) (C150P)	
* 165	A-8056-249-A	CD-154A (A) MOUNTED PWB	
166	3-947-268-01	TITE (2), +B TAPPING (P)	
167	1-500-227-31	BEAD, FERRITE	
168	1-657-183-11	PC BOARD, FP-314 FLEXIBLE	
169	1-777-299-11	CABLE, FLEXIBLE FLAT 25P	
170	1-777-303-11	CABLE, FLEXIBLE FLAT 25P	
171	1-956-269-11	HARNESS (VA-54)	
172	1-777-301-11	CABLE, FLEXIBLE FLAT 20P	
173	1-777-300-11	CABLE, FLEXIBLE FLAT 20P	
174	1-547-716-31	LENS, ZOOM (VCL-5412WA)	
175	3-973-270-01	SPACER, LENS	
* 176	1-674-600-11	PWB, LB-47A	
177	4-640-757-01	SHEET, ELECTROSTATIC	
178	3-973-269-01	SPACER, LB	

8-2. ELECTRICAL PARTS LIST

NOTE:
- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms.
  METAL:Metal-film resistor.
  METAL OXIDE: Metal oxide-film resistor.
  F:nonflammable
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u : µ, for example:
  uA.. : µA.. uPA.. : µPA..
  uPB.. : µPB.. uPC.. : µPC.. uPD.. : µPD..
- CAPACITORS
  uF : µF
- COILS
  uH : µH

When indicating parts by reference number, please include the board.

Ref. No.	Part No.	Description			Remark
*	A8056-258-A	AT-21A (A) MOUNT			
		**********			
		(Ref. No. 1,000 series)			
		< CAPACITOR >			
C801	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C802	1-135-181-21	TANTAL. CHIP	4.7uF	20%	6.3V
C803	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C804	1-135-181-21	TANTAL. CHIP	4.7uF	20%	6.3V
C805	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C806	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C830	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
		< CONNECTOR >			
CN845	1-691-519-11	CONNECTOR, BOARD TO BOARD 30P			
CN893	1-750-342-21	CONNECTOR, FFC/EPC (ZIF) 20P			
* CN894	1-580-789-21	PIN, CONNECTOR (SMD) 6P			
		< DIODE >			
D801	8-719-987-33	DIODE GL3HS8			
D802	8-719-420-83	DIODE MA3075WA-(TX)			
D803	8-719-420-83	DIODE MA3075WA-(TX)			
D804	8-719-420-83	DIODE MA3075WA-(TX)			
D805	8-719-420-83	DIODE MA3075WA-(TX)			
D806	8-719-422-91	DIODE MA8091-TX			
D807	8-719-420-83	DIODE MA3075WA-(TX)			
D808	8-719-420-83	DIODE MA3075WA-(TX)			
D809	8-719-420-83	DIODE MA3075WA-(TX)			
		< IC >			
IC801	8-759-391-16	IC CXD8497R			
IC802	8-759-527-29	IC HD6437034AR05F			
IC803	8-759-464-95	IC AK6420AF-E2			
IC804	8-759-438-74	IC TC74AC05F(EL)			
		< COIL >			
L801	1-412-058-11	INDUCTOR CHIP 10uH			
L802	1-412-058-11	INDUCTOR CHIP 10uH			
L803	1-412-058-11	INDUCTOR CHIP 10uH			
		< TRANSISTOR >			
Q801	8-729-029-14	TRANSISTOR DTC144EUA-T106			
Q802	8-729-420-13	TRANSISTOR XN4213-TW			
Q803	8-729-420-13	TRANSISTOR XN4213-TW			

Ref. No.	Part No.	Description			Remark
		< RESISTOR >			
R801	1-216-841-11	RES,CHIP	47K	5%	1/16W
R802	1-216-833-91	RES,CHIP	10K	5%	1/16W
R803	1-216-857-11	RES,CHIP	1M	5%	1/16W
R804	1-216-841-11	RES,CHIP	47K	5%	1/16W
R805	1-216-833-91	RES,CHIP	10K	5%	1/16W
R810	1-216-841-11	RES,CHIP	47K	5%	1/16W
R812	1-216-841-11	RES,CHIP	47K	5%	1/16W
R813	1-216-841-11	RES,CHIP	47K	5%	1/16W
R814	1-216-841-11	RES,CHIP	47K	5%	1/16W
R815	1-216-833-91	RES,CHIP	10K	5%	1/16W
R816	1-216-833-91	RES,CHIP	10K	5%	1/16W
R817	1-216-841-11	RES,CHIP	47K	5%	1/16W
R818	1-216-841-11	RES,CHIP	47K	5%	1/16W
R819	1-216-841-11	RES,CHIP	47K	5%	1/16W
R820	1-216-841-11	RES,CHIP	47K	5%	1/16W
R836	1-216-814-11	RES,CHIP	270	5%	1/16W
		< VIBRATOR >			
X801	1-579-553-11	VIBRATOR (12MHz)			
**********					
*	A-8056-249-A	CD-154A (A) MOUNT			
		**********			
		(Ref. No. 1,000 series)			
		< CAPACITOR >			
C891	1-135-214-21	TANTAL. CHIP	4.7uF	20%	20V
C892	1-135-210-11	TANTAL. CHIP	4.7uF	20%	10V
C894	1-164-346-11	CERAMIC CHIP	1uF		16V
C895	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C896	1-104-908-11	TANTAL. CHIP	47uF	20%	4V
		< CONNECTOR >			
CN891	1-750-340-21	CONNECTOR, FFC/EPC (ZIF) 16P			
		< COIL >			
L891	1-412-963-11	INDUCTOR	100uH		
		< TRANSISTOR >			
Q891	8-729-232-87	FET 2SK1875 (TE85L)			
Q892	8-729-144-28	TRANSISTOR 2SC4178-F13F14-T1			

Ref. No.	Part No.	Description			Remark
		< RESISTOR >			
R892	1-216-829-11	RES,CHIP	4.7K	5%	1/16W
R893	1-216-840-11	RES,CHIP	39K	5%	1/16W
R894	1-216-820-11	RES,CHIP	820	5%	1/16W
R895	1-216-845-11	RES,CHIP	100K	5%	1/16W
R896	1-216-809-11	RES,CHIP	100	5%	1/16W
R897	1-216-833-91	RES,CHIP	10K	5%	1/16W
**********					
*	A-8056-250-A	ID-11A (A) MOUNT			
		**********			
		(Ref. No. 2,000 series)			
		< CAPACITOR >			
C101	1-163-025-11	CERAMIC CHIP	0.001uF		50V
C137	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C138	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C139	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C141	1-104-851-11	TANTAL. CHIP	10uF	20%	10V
C143	1-104-913-11	TANTAL. CHIP	10uF	20%	16V
C147	1-104-851-11	TANTAL. CHIP	10uF	20%	10V
C148	1-104-851-11	TANTAL. CHIP	10uF	20%	10V
C149	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C151	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C152	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C153	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C154	1-163-015-11	CERAMIC CHIP	0.0033uF	10%	50V
C155	1-163-015-11	CERAMIC CHIP	0.0033uF	10%	50V
C162	1-124-557-11	ELECT	1000uF	20%	25V
C220	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
		< CONNECTOR >			
* CN102	1-580-057-11	PIN, CONNECTOR (SMD) 4P			
CN103	1-750-355-21	CONNECTOR, FFC/FPC (ZIF) 20P			
CN104	1-750-355-21	CONNECTOR, FFC/FPC (ZIF) 20P			
CN106	1-691-486-11	CONNECTOR, FFC/FPC 7P			
CN109	1-750-352-11	CONNECTOR, FFC/FPC (ZIF) 14P			
* CN110	1-750-005-11	PIN, CONNECTOR (PC BOARD) 4P			
CN111	1-764-259-21	CONNECTOR, D-SUB (ANGLE TYPE) 15P			
		< DIODE >			
D102	8-719-421-59	DIODE MA3130WA-TX			
D103	8-719-421-59	DIODE MA3130WA-TX			
D104	8-719-404-50	DIODE MA111-TX			
D105	8-719-404-50	DIODE MA111-TX			
D106	8-719-059-51	DIODE MA3J142E0LS0			
D109	8-719-421-59	DIODE MA3130WA-TX			
D110	8-719-421-59	DIODE MA3130WA-TX			
D112	8-719-050-90	DIODE MA736-TX			
D113	8-719-050-90	DIODE MA736-TX			
D114	8-719-050-90	DIODE MA736-TX			
D115	8-719-050-90	DIODE MA736-TX			

Ref. No.	Part No.	Description	Remark
D116	8-719-050-90	DIODE MA736-TX	
D117	8-719-050-90	DIODE MA736-TX	
D118	8-719-050-90	DIODE MA736-TX	
D119	8-719-050-90	DIODE MA736-TX	
D154	8-719-421-59	DIODE MA3130WA-TX	
D157	8-719-421-59	DIODE MA3130WA-TX	
D159	8-719-421-59	DIODE MA3130WA-TX	
D160	8-719-421-59	DIODE MA3130WA-TX	
D162	8-719-059-53	DIODE MA3J14700LS0	
D163	8-719-421-27	DIODE MA728-TX	
D164	8-719-421-59	DIODE MA3130WA-TX	
D165	8-719-421-59	DIODE MA3130WA-TX	
D168	8-719-422-91	DIODE MA8091-TX	
D169	8-719-422-91	DIODE MA8091-TX	
D170	8-719-422-91	DIODE MA8091-TX	
		< FUSE >	
F101	1-533-380-21	FUSE, CHIP (1A/12V)	
F102	1-533-380-21	FUSE, CHIP (1A/12V)	
F103	1-533-380-21	FUSE, CHIP (1A/12V)	
F104	1-576-269-21	FUSE (SMD)(3.15A)	
		< IC >	
IC101	8-759-711-58	IC NJM78L05UA-TE1	
IC102	8-759-428-66	IC TC7W04F (TE12R)	
IC103	8-759-259-77	IC PQ20VZ5U	
IC104	8-759-265-40	IC MAX202CSE-T	
IC105	8-759-354-60	IC TA8435H	
IC106	8-759-354-60	IC TA8435H	
IC109	8-759-366-35	IC TC4W66F (TE12R)	
		< JACK >	
J103	1-573-112-11	SOCKET, CONNECTOR 8P	
		< COIL >	
L102	1-414-226-21	INDUCTOR CHIP	
L103	1-414-226-21	INDUCTOR CHIP	
L104	1-414-226-21	INDUCTOR CHIP	
L105	1-414-226-21	INDUCTOR CHIP	
L107	1-414-226-21	INDUCTOR CHIP	
L108	1-414-226-21	INDUCTOR CHIP	
L109	1-414-226-21	INDUCTOR CHIP	
L110	1-414-226-21	INDUCTOR CHIP	
L111	1-414-078-11	INDUCTOR 10uH	
L112	1-414-078-11	INDUCTOR 10uH	
L113	1-500-113-22	FERRITE	
L115	1-500-113-22	FERRITE	
L116	1-500-113-22	FERRITE	
L117	1-500-113-22	FERRITE	
L118	1-500-113-22	FERRITE	
L123	1-500-113-22	FERRITE	
L124	1-500-113-22	FERRITE	

Ref. No.	Part No.	Description			Remark
		< TRANSISTOR >			
Q101	8-729-026-52	TRANSISTOR	2SA1576A-T106-QR		
Q102	8-729-029-14	TRANSISTOR	DTC144EUA-T106		
Q105	8-729-029-14	TRANSISTOR	DTC144EUA-T106		
Q110	8-729-905-38	TRANSISTOR	2SC4081T106R		
Q118	8-729-905-38	TRANSISTOR	2SC4081T106R		
Q119	8-729-029-14	TRANSISTOR	DTC144EUA-T106		
Q120	8-729-029-14	TRANSISTOR	DTC144EUA-T106		
Q121	8-729-029-14	TRANSISTOR	DTC144EUA-T106		
Q122	8-729-029-14	TRANSISTOR	DTC144EUA-T106		
Q123	8-729-029-14	TRANSISTOR	DTC144EUA-T106		
		< RESISTOR >			
R102	1-216-049-91	RES,CHIP	1K	5%	1/10W
R103	1-216-815-11	RES,CHIP	330	5%	1/16W
R112	1-216-864-11	SHORT	0		
R144	1-216-815-11	RES,CHIP	330	5%	1/16W
R152	1-216-837-11	RES,CHIP	22K	5%	1/16W
R153	1-216-833-91	RES,CHIP	10K	5%	1/16W
R155	1-218-294-11	RES,CHIP	30K	5%	1/16W
R156	1-216-826-11	RES,CHIP	2.7K	5%	1/16W
R159	1-216-833-11	RES,CHIP	10K	5%	1/16W
R160	1-216-855-11	RES,CHIP	680K	5%	1/16W
R163	1-216-049-91	RES,CHIP	1K	5%	1/10W
R169	1-216-845-11	RES,CHIP	100K	5%	1/16W
R170	1-216-845-11	RES,CHIP	100K	5%	1/16W
R171	1-216-845-11	RES,CHIP	100K	5%	1/16W
R172	1-216-845-11	RES,CHIP	100K	5%	1/16W
R173	1-216-829-11	RES,CHIP	4.7K	5%	1/16W
R174	1-216-829-11	RES,CHIP	4.7K	5%	1/16W
R175	1-216-845-11	RES,CHIP	100K	5%	1/16W
R176	1-216-845-11	RES,CHIP	100K	5%	1/16W
R177	1-216-845-11	RES,CHIP	100K	5%	1/16W
R178	1-216-845-11	RES,CHIP	100K	5%	1/16W
R183	1-216-150-91	RES,CHIP	10	5%	1/8W
R184	1-216-150-91	RES,CHIP	10	5%	1/8W
R185	1-216-150-91	RES,CHIP	10	5%	1/8W
R186	1-216-150-91	RES,CHIP	10	5%	1/8W
R187	1-216-150-91	RES,CHIP	10	5%	1/8W
R188	1-216-150-91	RES,CHIP	10	5%	1/8W
R189	1-216-150-91	RES,CHIP	10	5%	1/8W
R190	1-216-150-91	RES,CHIP	10	5%	1/8W
R191	1-216-150-91	RES,CHIP	10	5%	1/8W
R192	1-216-150-91	RES,CHIP	10	5%	1/8W
R193	1-216-150-91	RES,CHIP	10	5%	1/8W
R194	1-216-150-91	RES,CHIP	10	5%	1/8W
R195	1-216-150-91	RES,CHIP	10	5%	1/8W
R196	1-216-150-91	RES,CHIP	10	5%	1/8W
R197	1-216-150-91	RES,CHIP	10	5%	1/8W
R198	1-216-150-91	RES,CHIP	10	5%	1/8W
R238	1-216-841-11	RES,CHIP	47K	5%	1/16W
R239	1-216-841-11	RES,CHIP	47K	5%	1/16W
R240	1-216-841-11	RES,CHIP	47K	5%	1/16W

Ref. No.	Part No.	Description			Remark
R241	1-216-835-11	RES,CHIP	15K	5%	1/16W
R253	1-216-822-11	RES,CHIP	1.2K	5%	1/16W
R257	1-216-839-11	RES,CHIP	33K	5%	1/16W
R258	1-216-833-91	RES,CHIP	10K	5%	1/16W
R259	1-216-822-11	RES,CHIP	1.2K	5%	1/16W
R260	1-216-841-11	RES,CHIP	47K	5%	1/16W
R262	1-216-841-11	RES,CHIP	47K	5%	1/16W
		< TEST PIN >			
TP101	1-535-757-11	CHIP, CHECKER			
TP102	1-535-757-11	CHIP, CHECKER			
TP103	1-535-757-11	CHIP, CHECKER			
TP104	1-535-757-11	CHIP, CHECKER			
TP105	1-535-757-11	CHIP, CHECKER			
TP106	1-535-757-11	CHIP, CHECKER			
TP107	1-535-757-11	CHIP, CHECKER			
TP108	1-535-757-11	CHIP, CHECKER			
**********					
*	1-674-600-11	PWB, LB-47A			
		**********			
		(Ref. No. 1,000 series)			
		< BATTERY >			
BT401	1-528-694-11	BATTERY, V/L RICHARGEABL			
		< CONNECTOR >			
CN403	1-573-522-21	CONNECTOR, BOARD TO BOARD 14P			
**********					
*	A-8056-252-A	LD-84A (A) MOUNT (C150)			
*	A-8056-259-A	LD-84A (B) MOUNT (C150P)			
		**********			
		(Ref. No. 2,000 series)			
		< CAPACITOR >			
C701	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C702	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C703	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C704	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C705	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C706	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C707	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C708	1-104-752-11	TANTAL. CHIP	33uF	20%	6.3V
C709	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C710	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C711	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C712	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C713	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C714	1-135-181-21	TANTAL. CHIP	4.7uF	20%	6.3V
C715	1-162-974-11	CERAMIC CHIP	0.01uF		50V
		< CONNECTOR >			
CN701	1-766-833-21	CONNECTOR, FFC/FPC (ZIF) 21P			

Ref. No.	Part No.	Description			Remark
CN702	1-691-539-11	CONNECTOR, BOARD TO BOARD 30P			
		< IC >			
IC701	8-759-349-19	IC NJM3414AM-TE2			
IC702	8-759-351-31	IC MPC17A34RVMEL			
IC703	8-759-060-02	IC BA10324AF-E2			
IC704	8-752-365-65	IC CXD2126N-T4			
IC705	8-759-209-15	IC TC4SU69F(TE85R)			
		< COIL >			
L701	1-412-062-11	INDUCTOR CHIP 47uH			
L702	1-414-078-11	INDUCTOR 10uH			
L703	1-412-058-11	INDUCTOR CHIP 10uH			
		< TRANSISTOR >			
Q701	8-729-420-29	TRANSISTOR 2SD1819A-QRS-TX			
Q702	8-729-015-77	TRANSISTOR UN5211-TX			
		< RESISTOR >			
R701	1-216-809-11	RES,CHIP	100	5%	1/16W
R702	1-216-821-11	RES,CHIP	1K	5%	1/16W
R703	1-216-845-11	RES,CHIP	100K	5%	1/16W
R704	1-216-848-11	RES,CHIP	180K	5%	1/16W
R705	1-216-855-11	RES,CHIP	680K	5%	1/16W
R706	1-216-848-11	RES,CHIP	180K	5%	1/16W
R707	1-216-833-91	RES,CHIP	10K	5%	1/16W
R708	1-216-837-11	RES,CHIP	22K	5%	1/16W
R709	1-216-837-11	RES,CHIP	22K	5%	1/16W
R710	1-216-826-11	RES,CHIP	2.7K	5%	1/16W
R711	1-216-841-11	RES,CHIP	47K	5%	1/16W
R712	1-216-841-11	RES,CHIP	47K	5%	1/16W
R713	1-216-820-11	RES,CHIP	820	5%	1/16W
R714	1-216-837-11	RES,CHIP	22K	5%	1/16W
R715	1-216-841-11	RES,CHIP	47K	5%	1/16W
R716	1-216-827-11	RES,CHIP	3.3K	5%	1/16W
R717	1-216-837-11	RES,CHIP	22K	5%	1/16W
R718	1-216-828-11	RES,CHIP	3.9K	5%	1/16W
R719	1-216-851-11	RES,CHIP	330K	5%	1/16W
R720	1-216-821-11	RES,CHIP	1K	5%	1/16W
R721	1-216-821-11	RES,CHIP	1K	5%	1/16W
R722	1-216-821-11	RES,CHIP	1K	5%	1/16W
R723	1-216-821-11	RES,CHIP	1K	5%	1/16W
R724	1-216-821-11	RES,CHIP	1K	5%	1/16W
R725	1-216-821-11	RES,CHIP	1K	5%	1/16W
R726	1-216-833-91	RES,CHIP	10K	5%	1/16W
R727	1-218-865-11	RES,CHIP	5.6K	0.50%	1/16W
R728	1-218-855-11	RES,CHIP	2.2K	0.50%	1/16W
R729	1-216-864-11	SHORT	0		(C150P)
R730	1-216-864-11	SHORT	0		(C150)

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Ref. No.	Part No.	Description			Remark
*	1-674-602-11	PWB, LI-52A			
		**********			
		(Ref. No. 2,000 series)			
		< CONNECTOR >			
CN341	1-750-352-11	CONNECTOR, FFC/FPC (ZIF) 14P			
* CN342	1-750-005-11	PIN, CONNECTOR (PC BOARD) 4P			
* CN343	1-580-056-21	PIN, CONNECTOR (SMD) 3P			
		< PHOTO INTERRUPTER >			
PH341	8-749-012-73	PHOTO INTERRUPTER TLP830			

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*	1-674-603-11	PWB, LI-55A			
		**********			
		(Ref. No. 2,000 series)			
		< CONNECTOR >			
* CN361	1-580-057-11	PIN, CONNECTOR (SMD) 4P			
		< PHOTO INTERRUPTER >			
PH361	8-749-012-73	PHOTO INTERRUPTER TLP830			
PH362	8-749-012-73	PHOTO INTERRUPTER TLP830			

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*	1-674-604-11	PWB, LI-59A			
		**********			
		(Ref. No. 2,000 series)			
		< CONNECTOR >			
* CN351	1-580-056-21	PIN, CONNECTOR (SMD) 3P			
		< PHOTO INTERRUPTER >			
PH351	8-749-012-73	PHOTO INTERRUPTER TLP830			

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*	A-7072-760-A	MD-68 (A) MOUNT			
		**********			
		(Ref. No. 1,000 series)			
		< CAPACITOR >			
C102	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C103	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C104	1-107-685-11	TANTAL. CHIP	15uF	20%	6.3V
C105	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C106	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C107	1-164-361-11	CERAMIC CHIP	0.047uF		25V
C108	1-135-091-00	TANTAL. CHIP	1uF	20%	16V
C109	1-164-361-11	CERAMIC CHIP	0.047uF		25V
C110	1-164-361-11	CERAMIC CHIP	0.047uF		25V
C111	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C112	1-104-851-11	TANTAL. CHIP	10uF	20%	10V
C113	1-107-685-11	TANTAL. CHIP	15uF	20%	6.3V
C114	1-162-974-11	CERAMIC CHIP	0.01uF		50V

MD-68 (A)

Ref. No.	Part No.	Description			Remark
C115	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C116	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C117	1-164-361-11	CERAMIC CHIP	0.047uF		25V
C118	1-164-361-11	CERAMIC CHIP	0.047uF		25V
C119	1-164-361-11	CERAMIC CHIP	0.047uF		25V
C120	1-164-361-11	CERAMIC CHIP	0.047uF		25V
C121	1-164-361-11	CERAMIC CHIP	0.047uF		25V
C122	1-164-361-11	CERAMIC CHIP	0.047uF		25V
C123	1-164-361-11	CERAMIC CHIP	0.047uF		25V
C124	1-164-361-11	CERAMIC CHIP	0.047uF		25V
C125	1-164-361-11	CERAMIC CHIP	0.047uF		25V
C126	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C127	1-162-919-11	CERAMIC CHIP	22PF	5%	50V
C128	1-162-918-11	CERAMIC CHIP	18PF	5%	50V
C129	1-135-259-11	TANTAL, CHIP	10uF	20%	6.3V
C130	1-162-974-11	CERAMIC CHIP	0.01uF		50V
		< CONNECTOR >			
* CN101	1-580-056-21	PIN, CONNECTOR (SMD) 3P			
CN102	1-774-201-11	CONNECTOR, FFC/FPC 25P			
CN105	1-750-342-21	CONNECTOR, FFC/EPC (ZIF) 20P			
CN106	1-774-201-11	CONNECTOR, FFC/FPC 25P			
		< DIODE >			
D104	8-719-059-51	DIODE MA3J142E0LS0			
D105	8-719-421-27	DIODE MA728-TX			
D106	8-719-421-27	DIODE MA728-TX			
D107	8-719-421-27	DIODE MA728-TX			
D108	8-719-422-91	DIODE MA8091-TX			
D109	8-719-422-91	DIODE MA8091-TX			
D110	8-719-422-91	DIODE MA8091-TX			
		< IC >			
IC101	8-759-458-91	IC MB89098RPFV-G-153-BND			
IC102	8-759-464-95	IC AK6420AF-E2			
IC103	8-759-295-62	IC S-8423DFS-T2			
IC104	8-759-536-72	IC TL1596CPWR			
IC105	8-759-259-77	IC PQ20VZ5U			
IC106	8-759-336-96	IC uPD6461GS-814-GLG-E2			
IC107	8-759-031-58	IC SC7SU04FER			
		< COIL >			
L101	1-414-081-11	INDUCTOR	33uH		
L102	1-414-078-11	INDUCTOR	10uH		
		< IC LINK >			
PS101	1-576-123-21	LINK, IC (CCP2E20) 0.8A			
		< TRANSISTOR >			
Q103	8-729-028-91	TRANSISTOR DTA144EUA-T106			
Q104	8-729-029-14	TRANSISTOR DTC144EUA-T106			

Ref. No.	Part No.	Description			Remark
		< RESISTOR >			
R101	1-216-295-91	SHORT	0		
R108	1-216-845-11	RES,CHIP	100K	5%	1/16W
R109	1-216-845-11	RES,CHIP	100K	5%	1/16W
R110	1-216-811-11	RES,CHIP	150	5%	1/16W
R111	1-216-841-11	RES,CHIP	47K	5%	1/16W
R112	1-216-836-11	RES,CHIP	18K	5%	1/16W
R113	1-216-836-11	RES,CHIP	18K	5%	1/16W
R114	1-216-851-11	RES,CHIP	330K	5%	1/16W
R115	1-216-817-11	RES,CHIP	470	5%	1/16W
R116	1-216-821-11	RES,CHIP	1K	5%	1/16W
R117	1-216-821-11	RES,CHIP	1K	5%	1/16W
R118	1-216-845-11	RES,CHIP	100K	5%	1/16W
R119	1-216-845-11	RES,CHIP	100K	5%	1/16W
R120	1-216-864-11	SHORT	0		
R121	1-216-826-11	RES,CHIP	2.7K	5%	1/16W
R123	1-216-848-11	RES,CHIP	180K	5%	1/16W
R124	1-216-809-11	RES,CHIP	100	5%	1/16W
R125	1-216-833-91	RES,CHIP	10K	5%	1/16W
R126	1-216-833-91	RES,CHIP	10K	5%	1/16W
R127	1-216-834-11	RES,CHIP	12K	5%	1/16W
R128	1-216-826-11	RES,CHIP	2.7K	5%	1/16W
R131	1-216-841-11	RES,CHIP	47K	5%	1/16W
R132	1-216-811-11	RES,CHIP	150	5%	1/16W
R134	1-216-829-11	RES,CHIP	4.7K	5%	1/16W
R135	1-216-841-11	RES,CHIP	47K	5%	1/16W
R136	1-216-841-11	RES,CHIP	47K	5%	1/16W
R138	1-216-849-11	RES,CHIP	220K	5%	1/16W
R139	1-216-853-11	RES,CHIP	470K	5%	1/16W
R140	1-216-851-11	RES,CHIP	330K	5%	1/16W
R141	1-216-049-91	RES,CHIP	1K	5%	1/10W
R142	1-216-864-11	SHORT	0		
R144	1-216-864-11	SHORT	0		
R145	1-216-864-11	SHORT	0		
R151	1-216-864-11	SHORT	0		
R152	1-216-864-11	SHORT	0		
R153	1-216-864-11	SHORT	0		
R154	1-216-864-11	SHORT	0		
R155	1-216-864-11	SHORT	0		
R156	1-216-864-11	SHORT	0		
R157	1-216-864-11	SHORT	0		
R158	1-216-864-11	SHORT	0		
R159	1-216-864-11	SHORT	0		
R160	1-216-864-11	SHORT	0		
R161	1-216-864-11	SHORT	0		
R162	1-216-864-11	SHORT	0		
R163	1-216-864-11	SHORT	0		
R164	1-216-864-11	SHORT	0		
R165	1-216-864-11	SHORT	0		
R167	1-216-821-11	RES,CHIP	1K	5%	1/16W
R168	1-216-821-11	RES,CHIP	1K	5%	1/16W
R169	1-216-821-11	RES,CHIP	1K	5%	1/16W

Ref. No.	Part No.	Description			Remark
R170	1-216-821-11	RES,CHIP	1K	5%	1/16W
R172	1-216-821-11	RES,CHIP	1K	5%	1/16W
R173	1-216-821-11	RES,CHIP	1K	5%	1/16W
R174	1-216-821-11	RES,CHIP	1K	5%	1/16W
R175	1-216-821-11	RES,CHIP	1K	5%	1/16W
R176	1-216-821-11	RES,CHIP	1K	5%	1/16W
R177	1-216-821-11	RES,CHIP	1K	5%	1/16W
R178	1-216-821-11	RES,CHIP	1K	5%	1/16W
R179	1-216-821-11	RES,CHIP	1K	5%	1/16W
R180	1-216-821-11	RES,CHIP	1K	5%	1/16W
R181	1-216-821-11	RES,CHIP	1K	5%	1/16W
R182	1-216-821-11	RES,CHIP	1K	5%	1/16W
R183	1-216-821-11	RES,CHIP	1K	5%	1/16W
R184	1-216-821-11	RES,CHIP	1K	5%	1/16W
R185	1-216-821-11	RES,CHIP	1K	5%	1/16W
R186	1-216-821-11	RES,CHIP	1K	5%	1/16W
R187	1-216-821-11	RES,CHIP	1K	5%	1/16W
R188	1-216-821-11	RES,CHIP	1K	5%	1/16W
R189	1-216-821-11	RES,CHIP	1K	5%	1/16W
R191	1-216-833-91	RES,CHIP	10K	5%	1/16W
R192	1-216-833-91	RES,CHIP	10K	5%	1/16W
R193	1-216-833-91	RES,CHIP	10K	5%	1/16W
R194	1-216-833-91	RES,CHIP	10K	5%	1/16W
R195	1-216-833-91	RES,CHIP	10K	5%	1/16W
R196	1-216-833-91	RES,CHIP	10K	5%	1/16W
R197	1-216-833-91	RES,CHIP	10K	5%	1/16W
R198	1-216-833-91	RES,CHIP	10K	5%	1/16W
R199	1-216-833-91	RES,CHIP	10K	5%	1/16W
		< VIBRATOR >			
X101	1-760-458-21	VIBRATOR, CRYSTAL (32kHz)			
XTL101	1-579-369-21	VIBRATOR (10MHz)			

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*	A-856-257-A	RM-77A (A) MOUNT			
		**********			
		(Ref. No. 1,000 series)			
		< CAPACITOR >			
C381	1-104-752-11	TANTAL, CHIP	33uF	20%	6.3V
C382	1-104-752-11	TANTAL, CHIP	33uF	20%	6.3V
C383	1-162-974-11	CERAMIC CHIP	0.01uF		50V
CN381	1-691-486-21	CONNECTOR, FFC/FPC 7P			
		< DIODE >			
D382	8-719-938-67	DIODE GL3EG8			
D383	8-719-420-83	DIODE MA3075WA-(TX)			
D384	8-719-420-83	DIODE MA3075WA-(TX)			
		< IC >			
IC381	8-749-015-48	IC RPM6940			
IC382	8-749-015-48	IC RPM6940			
IC383	8-759-235-15	IC TC74HC04AF (EL)			
		< RESISTOR >			
R382	1-216-821-11	RES, CHIP	1K	5%	1/16W
R383	1-216-805-11	RES, CHIP	47	5%	1/16W
R384	1-216-805-11	RES, CHIP	47	5%	1/16W
R386	1-216-864-11	SHORT	0		

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*	A-8056-256-A	RS-67A (A) MOUNT			
		**********			
		(Ref. No. 2,000 series)			
		< CAPACITOR >			
C401	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C402	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C403	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C404	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C405	1-162-914-11	CERAMIC CHIP	9PF	0.5PF	50V
C406	1-162-915-11	CERAMIC CHIP	10PF	0.5PF	50V
		< CONNECTOR >			
CN401	1-774-202-21	CONNECTOR, FFC/FPC 25P			
* CN402	1-691-922-11	CONNECTOR, BOARD TO BOARD 14P			
		< DIODE >			
D402	8-719-938-72	DIODE SB01-05CP-TB			
D404	8-719-420-83	DIODE MA3075WA-(TX)			
D405	8-719-420-83	DIODE MA3075WA-(TX)			
		< IC >			
IC401	8-759-149-05	IC uPD71051GB-10-3B4			
IC402	8-759-235-15	IC TC74HC04AF(EL)			
		< COIL >			
L401	1-414-081-11	INDUCTOR	33uH		
L402	1-414-081-11	INDUCTOR	33uH		
		< RESISTOR >			
R401	1-219-570-11	RES,CHIP	10M	5%	1/16W
R402	1-216-850-11	RES,CHIP	270K	5%	1/16W
R403	1-216-813-11	RES,CHIP	220	5%	1/16W
R404	1-216-295-91	SHORT	0		
R407	1-216-841-11	RES,CHIP	47K	5%	1/16W
R412	1-216-857-11	RES,CHIP	1M	5%	1/16W
		< SWITCH >			
S401	1-570-114-11	SWITCH,SLIDE			
		< VIBRATOR >			
X401	1-767-169-11	VIBRATOR, CRYSTAL (153.6kHz)			
X402	1-579-369-21	VIBRATOR (10MHz)			

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VC-179 (A)/179 (B)

Ref. No.	Part No.	Description			Remark
*	A-7072-759-A	VC-179 (A) MOUNT (C150)			
*	A-7072-790-A	VC-179 (B) MOUNT (C150P)			
		**********			
		(Ref. No. 1,000 series)			
		< CAPACITOR >			
C001	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C002	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C004	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C005	1-164-326-91	CERAMIC CHIP	0.47uF		16V
C006	1-135-338-91	TANTAL. CHIP	220uF	20%	4V
C007	1-135-181-21	TANTAL. CHIP	4.7uF	20%	6.3V
C008	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C009	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C010	1-135-338-91	TANTAL. CHIP	220uF	20%	4V
C011	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C012	1-135-181-21	TANTAL. CHIP	4.7uF	20%	6.3V
C013	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C014	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C017	1-164-326-91	CERAMIC CHIP	0.47uF		16V
C019	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C301	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C302	1-162-928-11	CERAMIC CHIP	120PF	5%	50V
C304	1-104-916-11	TANTAL. CHIP	6.8uF	20%	20V
C307	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C309	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C310	1-162-965-11	CERAMIC CHIP	0.0015uF	10%	50V
C311	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C312	1-107-727-91	CERAMIC CHIP	0.022uF	10%	16V
C313	1-164-730-11	CERAMIC CHIP	0.0012uF	10%	50V
C315	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C316	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C317	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C318	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C319	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C320	1-162-963-11	CERAMIC CHIP	680PF	10%	50V
C321	1-162-963-11	CERAMIC CHIP	680PF	10%	50V
C322	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C323	1-162-963-11	CERAMIC CHIP	680PF	10%	50V
C326	1-165-178-11	CERAMIC CHIP	6.8uF		16V
C327	1-165-178-11	CERAMIC CHIP	6.8uF		16V
C328	1-104-760-11	CERAMIC CHIP	0.047uF	10%	50V
C329	1-165-178-11	CERAMIC CHIP	6.8uF		16V
C330	1-165-178-11	CERAMIC CHIP	6.8uF		16V
C331	1-165-178-11	CERAMIC CHIP	6.8uF		16V
C332	1-164-506-11	CERAMIC CHIP	4.7uF		16V
C333	1-107-682-11	CERAMIC CHIP	1uF	10%	16V
C334	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C335	1-164-337-11	CERAMIC CHIP	2.2uF		16V
C336	1-164-337-11	CERAMIC CHIP	2.2uF		16V
C339	1-162-638-11	CERAMIC CHIP	1uF		16V
C340	1-135-181-21	TANTAL. CHIP	4.7uF	20%	6.3V
C401	1-162-637-11	CERAMIC CHIP	0.47uF		16V

Ref. No.	Part No.	Description			Remark
C402	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C403	1-164-346-11	CERAMIC CHIP	1uF		16V
C404	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C405	1-135-145-11	TANTAL. CHIP	0.47uF	20%	35V
C406	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C407	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C408	1-135-214-21	TANTAL. CHIP	4.7uF	20%	20V
C409	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C410	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C411	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C412	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C413	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C414	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C415	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C417	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C418	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C420	1-162-922-11	CERAMIC CHIP	39PF	5%	50V
C421	1-162-916-11	CERAMIC CHIP	12PF	5%	50V
C422	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C423	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C424	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C425	1-135-145-11	TANTAL. CHIP	0.47uF	20%	35V
C426	1-164-492-11	CERAMIC CHIP	0.15uF	10%	16V
C427	1-135-145-11	TANTAL. CHIP	0.47uF	20%	35V
C428	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C429	1-164-492-11	CERAMIC CHIP	0.15uF	10%	16V
C430	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C434	1-164-346-11	CERAMIC CHIP	1uF		16V
C435	1-164-346-11	CERAMIC CHIP	1uF		16V
C436	1-135-181-21	TANTAL. CHIP	4.7uF	20%	6.3V
C437	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C501	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C502	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C503	1-135-181-21	TANTAL. CHIP	4.7uF	20%	6.3V
C506	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C507	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C508	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C509	1-135-181-21	TANTAL. CHIP	4.7uF	20%	6.3V
C511	1-107-685-11	TANTAL. CHIP	15uF	20%	6.3V
C512	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C514	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C515	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C516	1-164-360-11	CERAMIC CHIP	0.1uF	10%	16V (C150P)
C518	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C519	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C524	1-135-091-91	TANTAL. CHIP	1uF	20%	16V
C525	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C526	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C527	1-162-946-11	CERAMIC CHIP	27PF	5%	50V
C528	1-162-946-11	CERAMIC CHIP	27PF	5%	50V
C529	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C530	1-164-346-11	CERAMIC CHIP	1uF		16V

Ref. No.	Part No.	Description			Remark
C531	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C532	1-135-181-21	TANTAL. CHIP	4.7uF	20%	6.3V
		< CONNECTOR >			
* CN001	1-580-789-21	PIN, CONNECTOR (SMD) 6P			
* CN301	1-580-055-21	PIN, CONNECTOR 2P			
CN401	1-750-340-21	CONNECTOR, FFC/EPC (ZIF) 16P			
CN501	1-691-519-11	CONNECTOR, BOARD TO BOARD 30P			
* CN502	1-691-529-11	CONNECTOR, BOARD TO BOARD 30P			
CN504	1-774-202-21	CONNECTOR, FFC/FPC 25P			
		< DIODE >			
D001	8-0719-059-51	DIODE	MA3J142E0LS0		
D302	8-719-027-77	DIODE	MA796-TX		
D401	8-719-404-50	DIODE	MA111-TX		
D402	8-719-404-50	DIODE	MA111-TX		
D403	8-719-404-50	DIODE	MA111-TX		
D404	8-719-404-50	DIODE	MA111-TX		
D406	8-713-102-28	DIODE	1T379-04-T8A		
		< LOW PASS FILTER >			
FL501	1-239-352-11	FILTER, LOW PASS			
		< IC >			
IC001	8-752-061-70	IC	CXA1409AQ-T4		
IC302	8-759-060-93	IC	MB3785APFV-G-BND-ER		
IC401	8-752-372-35	IC	CXD1267AN-T4		
IC402	8-752-374-25	IC	CXD2415R-T4		
IC403	8-752-073-11	IC	CXA2006Q-T4		
IC404	8-759-064-36	IC	MB88346BPFV-EF		
IC405	8-752-375-12	IC	CXD2407BR-T4		
IC406	8-759-495-27	IC	AD876JST-REEL		
IC501	8-759-464-95	IC	AK6420AF-E2		
IC502	8-759-458-92	IC	MC68HC11MA8FU-SC424626FU		
IC503	8-752-375-10	IC	CXD2150BR-T6		
IC504	8-752-376-29	IC	CXD2151AR-T6		
IC505	8-759-288-14	IC	CXD2133CR-T6		
		< COIL >			
L001	1-412-058-11	INDUCTOR CHIP	10uH		
L002	1-500-113-22	FERRITE			
L003	1-500-113-22	FERRITE			
L004	1-500-113-22	FERRITE			
L304	1-424-653-11	INDUCTOR	10uH		
L305	1-424-653-11	INDUCTOR	10uH		
L306	1-424-674-11	INDUCTOR	22uH		
L307	1-424-674-11	INDUCTOR	22uH		
L308	1-424-674-11	INDUCTOR	22uH		
L309	1-412-026-11	INDUCTOR CHIP	1uH		
L310	1-412-033-11	INDUCTOR CHIP	220uH		
L311	1-412-033-11	INDUCTOR CHIP	220uH		

Ref. No.	Part No.	Description			Remark
L313	1-412-028-11	INDUCTOR CHIP	4.7uH		
L315	1-412-028-11	INDUCTOR CHIP	4.7uH		
L401	1-412-058-11	INDUCTOR CHIP	10uH		
L402	1-414-078-11	INDUCTOR	10uH		
L403	1-412-058-11	INDUCTOR CHIP	10uH		
L404	1-414-078-11	INDUCTOR	10uH		
L405	1-414-078-11	INDUCTOR	10uH		
L501	1-412-058-11	INDUCTOR CHIP	10uH		
L502	1-414-078-11	INDUCTOR	10uH		
L503	1-414-078-11	INDUCTOR	10uH		
L504	1-414-078-11	INDUCTOR	10uH		
L505	1-412-959-11	INDUCTOR	47uH (C150P)		
L505	1-412-961-11	INDUCTOR	68uH (C150)		
L506	1-414-078-11	INDUCTOR	10uH		
		< TRANSISTOR >			
Q304	8-729-804-52	TRANSISTOR	2SB1122-T-TD		
Q305	8-729-823-84	TRANSISTOR	FP102-TL		
Q306	8-729-823-84	TRANSISTOR	FP102-TL		
Q307	8-729-823-84	TRANSISTOR	FP102-TL		
Q308	8-729-403-35	TRANSISTOR	UN5113-TX		
Q401	8-729-403-27	TRANSISTOR	XN4401-(TW)		
Q501	8-729-420-24	TRANSISTOR	2SB1218A-QRS-TX		
Q502	8-729-420-24	TRANSISTOR	2SB1218A-QRS-TX		
Q503	8-729-420-29	TRANSISTOR	2SD1819A-QRS-TX		
Q504	8-729-420-24	TRANSISTOR	2SB1218A-QRS-TX		
		< RESISTOR >			
R001	1-216-807-11	RES,CHIP	68	5%	1/16W
R005	1-216-807-11	RES,CHIP	68	5%	1/16W
R006	1-216-837-11	RES,CHIP	22K	5%	1/16W
R007	1-216-837-11	RES,CHIP	22K	5%	1/16W
R008	1-216-807-11	RES,CHIP	68	5%	1/16W
R009	1-216-824-11	RES,CHIP	1.8K	5%	1/16W
R010	1-216-829-11	RES,CHIP	4.7K	5%	1/16W
R011	1-216-837-11	RES,CHIP	22K	5%	1/16W
R012	1-216-837-11	RES,CHIP	22K	5%	1/16W
R033	1-216-821-11	RES,CHIP	1K	5%	1/16W
R302	1-218-865-11	RES,CHIP	5.6K	0.50%	1/16W
R303	1-216-837-11	RES,CHIP	22K	5%	1/16W
R306	1-216-842-11	RES,CHIP	56K	5%	1/16W
R307	1-216-837-11	RES,CHIP	22K	5%	1/16W
R310	1-216-841-11	RES,CHIP	47K	5%	1/16W
R312	1-218-876-11	RES,CHIP	16K	0.50%	1/16W
R313	1-216-834-11	RES,CHIP	12K	5%	1/16W
R314	1-218-874-11	RES,CHIP	13K	0.50%	1/16W
R315	1-218-891-11	RES,CHIP	68K	0.50%	1/16W
R316	1-218-875-11	RES,CHIP	15K	0.50%	1/16W
R318	1-218-885-11	RES,CHIP	39K	0.50%	1/16W
R319	1-216-832-11	RES,CHIP	8.2K	5%	1/16W
R320	1-216-830-11	RES,CHIP	5.6K	5%	1/16W
R321	1-216-845-11	RES,CHIP	100K	5%	1/16W
R322	1-216-847-11	RES,CHIP	150K	5%	1/16W

Ref. No.	Part No.	Description			Remark
R323	1-218-879-11	RES,CHIP	22K	0.50%	1/16W
R325	1-218-875-11	RES,CHIP	15K	0.50%	1/16W
R326	1-218-873-11	RES,CHIP	12K	0.50%	1/16W
R327	1-218-881-11	RES,CHIP	27K	0.50%	1/16W
R329	1-218-865-11	RES,CHIP	5.6K	0.50%	1/16W
R330	1-216-832-11	RES,CHIP	8.2K	5%	1/16W
R332	1-218-875-11	RES,CHIP	15K	0.50%	1/16W
R333	1-216-819-11	RES,CHIP	680	5%	1/16W
R334	1-216-864-11	SHORT	0		
R335	1-218-847-11	RES,CHIP	1K	0.50%	1/16W
R336	1-216-845-11	RES,CHIP	100K	5%	1/16W
R337	1-216-033-91	RES,CHIP	220	5%	1/10W
R338	1-216-027-91	RES,CHIP	120	5%	1/10W
R339	1-216-041-91	RES,CHIP	470	5%	1/10W
R340	1-216-041-91	RES,CHIP	470	5%	1/10W
R341	1-216-821-11	RES,CHIP	1K	5%	1/16W
R342	1-216-009-91	RES,CHIP	22	5%	1/10W
R344	1-216-841-11	RES,CHIP	47K	5%	1/16W
R345	1-216-828-11	RES,CHIP	3.9K	5%	1/16W
R346	1-211-989-11	RES,CHIP	68	0.50%	1/16W
R401	1-216-845-11	RES,CHIP	100K	5%	1/16W
R402	1-216-845-11	RES,CHIP	100K	5%	1/16W
R403	1-216-857-11	RES,CHIP	1M	5%	1/16W
R404	1-216-833-91	RES,CHIP	10K	5%	1/16W
R405	1-216-845-11	RES,CHIP	100K	5%	1/16W
R406	1-218-876-11	RES,CHIP	16K	0.50%	1/16W
R407	1-218-847-11	RES,CHIP	1K	0.50%	1/16W
R408	1-216-864-11	SHORT	0		
R409	1-216-864-11	SHORT	0		
R410	1-216-864-11	SHORT	0		
R411	1-216-864-11	SHORT	0		
R412	1-216-811-11	RES,CHIP	150	5%	1/16W
R413	1-216-823-11	RES,CHIP	1.5K	5%	1/16W
R414	1-216-803-11	RES,CHIP	33	5%	1/16W
R415	1-216-853-11	RES,CHIP	470K	5%	1/16W
R417	1-216-864-11	SHORT	0		(C150P)
R420	1-216-864-11	SHORT	0		
R501	1-216-857-11	RES,CHIP	1M	5%	1/16W
R502	1-216-851-11	RES,CHIP	330K	5%	1/16W
R503	1-216-833-91	RES,CHIP	10K	5%	1/16W
R504	1-216-833-91	RES,CHIP	10K	5%	1/16W
R505	1-216-821-11	RES,CHIP	1K	5%	1/16W
R506	1-216-841-11	RES,CHIP	47K	5%	1/16W
R507	1-216-841-11	RES,CHIP	47K	5%	1/16W
R508	1-216-841-11	RES,CHIP	47K	5%	1/16W
R509	1-216-841-11	RES,CHIP	47K	5%	1/16W
R510	1-216-821-11	RES,CHIP	1K	5%	1/16W (C150P)
R511	1-216-844-11	RES,CHIP	82K	5%	1/16W (C150P)
R512	1-216-864-11	SHORT	0		(C150)
R513	1-216-833-91	RES,CHIP	10K	5%	1/16W
R514	1-216-819-11	RES,CHIP	680	5%	1/16W
R515	1-216-863-11	RES,CHIP	3.3M	5%	1/16W (C150P)
R516	1-216-833-91	RES,CHIP	10K	5%	1/16W
R517	1-216-821-11	RES,CHIP	1K	5%	1/16W
R518	1-216-825-11	RES,CHIP	2.2K	5%	1/16W
R519	1-216-819-11	RES,CHIP	680	5%	1/16W
R520	1-216-845-11	RES,CHIP	100K	5%	1/16W
R521	1-216-837-11	RES,CHIP	22K	5%	1/16W
R522	1-216-839-11	RES,CHIP	33K	5%	1/16W
R523	1-216-815-11	RES,CHIP	330	5%	1/16W
R524	1-216-833-91	RES,CHIP	10K	5%	1/16W
R525	1-216-821-11	RES,CHIP	1K	5%	1/16W
R526	1-216-827-11	RES,CHIP	3.3K	5%	1/16W
R527	1-216-821-11	RES,CHIP	1K	5%	1/16W
R528	1-216-825-11	RES,CHIP	2.2K	5%	1/16W
R529	1-216-817-11	RES,CHIP	470	5%	1/16W (C150P)
R529	1-216-823-11	RES,CHIP	1.5K	5%	1/16W (C150)
R530	1-216-841-11	RES,CHIP	47K	5%	1/16W
R531	1-216-841-11	RES,CHIP	47K	5%	1/16W
R532	1-216-821-11	RES,CHIP	1K	5%	1/16W
R533	1-216-825-11	RES,CHIP	2.2K	5%	1/16W
R534	1-216-825-11	RES,CHIP	2.2K	5%	1/16W
R536	1-216-864-11	SHORT	0		
R538	1-216-864-11	SHORT	0		
		< TRANSFORMER >			
T301	1-450-976-11	TRANSFORMER, CONVERTER			
		< VIBRATOR >			
X401	1-760-320-41	VIBRATOR, CRYSTAL (28.6363MHz)(C150)			
X401	1-760-321-41	VIBRATOR, CRYSTAL (28.375MHz)(C150P)			
X501	1-760-081-21	VIBRATOR, CERAMIC (24MHz)			
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		MISCELLANEOUS			
		**********			
12	1-177-304-11	FLAT CABLE,7P			
77	1-956-267-11	HARNESS (IL-52)			
78	1-777-302-11	CABLE, FLEXIBLE FLAT 14P			
135	1-956-270-11	HARNESS (LL-51)			
162	1-547-735-51	FILTER BLOCK, OPTICAL			
167	1-500-227-31	BEAD, FERRITE			
168	1-657-183-11	PC BOARD, FP-314 FLEXIBLE			
169	1-777-299-11	CABLE, FLEXIBLE FLAT 25P			
170	1-777-303-11	CABLE, FLEXIBLE FLAT 25P			
171	1-956-269-11	HARNESS (VA-54)			
172	1-777-301-11	CABLE, FLEXIBLE FLAT 20P			
173	1-777-300-11	CABLE, FLEXIBLE FLAT 20P			
174	1-547-716-31	LENS, ZOOM (VCL-5412WA)			
M1	1-698-797-12	MOTOR, DC (STEPPING MOTOR) (PAN)			
M2	1-698-797-22	MOTOR, DC (STEPPING MOTOR) (TILT)			